IMPACT OF CONSTRUCTIVE CAPITALISATION OF OPERATING LEASES ON SOUTH AFRICAN COMPANIES CONSIDERING NEW PROPOSED LEASE ACCOUNTING RULES

by

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DISSERTATION

submitted in partial fulfilment
of the requirements for the

MASTER OF COMMERCE

Financial Management

UNIVERSITY OF CAPE TOWN

Supervisor: Prof C. Correia

February 2014

Declaration

I, *Johnathan Dillon*, hereby declare that the work in this dissertation is my own work and that to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgment is made in this dissertation. Furthermore, any contribution made to the research by others is explicitly acknowledged in this dissertation. I also declare that the intellectual content of this dissertation is the product of my own work, except to the extent acknowledged.

Name: Johnathan Dillon

Signed: _____

Date: 13 February 2014

Dedication

I dedicate this dissertation to my family, especially…

to my precious wife, Lindsay, for her unending support, love and motivation to keep pushing on – I am forever grateful, know that my victories are our victories;

to my late father, John Edward Dillon, whose faith-filled life and loving memory has never failed to inspire and encourage me;

to my loving mother for her sincere belief in me and practical support.

I hope this work makes you proud.

Acknowledgements

Completing this dissertation has been one of the most challenging activities of my life thus far; however, it would not have been possible without God"s divine help, wisdom and strength as well as the assistance and support of the people around me, to only some of whom it is possible to make particular mention of here, as noted below:

- My first debt of gratitude goes to my supervisor, Prof Carlos Correia from the University of Cape Town"s (UCT) College of Accounting, who, despite being on research sabbatical outside of South Africa, assisted me greatly with excellent feedback and support from beginning to end. I am eternally grateful to him and feel extremely privileged to have been supervised by such a wise man that has a phenomenal depth and breadth of finance and related knowledge.
- My line managers at Nelson Mandela Metropolitan University (NMMU), Prof Frans Prinsloo and Ms Beryl Prinsloo, also deserve my sincerest thanks, for allowing me great flexibility to pursue my studies and complete my Master"s dissertation.
- I will also be forever thankful to Prof Miemie Struwig from NMMU"s Department of Business Management for her time taken to meet with me, guidance and constructive feedback with respect to my writing and her excellent insights into the research process from which I learnt a great deal.
- NMMU, my employer, also deserves mention for the financial support granted towards my Master"s studies which is greatly appreciated.
- Furthermore, I would also like to thank my colleagues within the NMMU School of Accounting, more specifically within the Management Accounting and Finance Division, for their encouragement and willingness to assist while I was on sabbatical and focused on completing this dissertation. In particular, I am very grateful to Prof Derek Forsyth for his advice with respect to certain financial accounting aspects relating to my lease research.
- Finally, I would also like to thank all my family and friends for their endless love and support of whom, above all, I would like to thank my wife, Lindsay, for her understanding and personal support at all times which allowed me to finish this journey.

Abstract

This study analyses the impact that operating lease capitalisation has on key financial statement ratios and failure prediction indicators of listed South African companies operating within five sectors (namely General Industrials, Industrial Transportation, Food & Drug Retailers, General Retailers and Travel & Leisure), as well as whether the impact thereof is substantially the same as the new proposed accounting treatment for Type A and Type B leases in terms of ED/2013/6 (IASB, 2013). Furthermore, the extent of lease usage in South Africa and whether the size of a company has a bearing on its extent of leasing is examined. Additional analysis is also performed investigating the materiality of straight-lining and onerous contract provisions relating to operating leases, as well as the impact of operating lease capitalisation on disclosed loan covenants. Based predominantly on the constructive operating lease capitalisation method developed by Imhoff, Lipe and Wright (1991 & 1997), a refined constructive lease capitalisation model is developed in this study which incorporates aspects of current lease accounting rules not previously considered, namely provisions recognised in respect of the straight-lining of operating leases as well as onerous operating lease contracts. This model also incorporates the new proposed lease accounting rules which require the capitalisation of all leases (Type A and Type B). The results indicate that the capitalisation of future non-cancellable operating lease commitments have a significant impact on key financial statement ratios and failure prediction indicators, most notably leverage and other debt-related ratios. Furthermore, of the five sectors analysed, retailers were the most affected. When considering the new proposed accounting treatment for Type A and Type B leases, the results indicate that operating lease capitalisation has substantially the same impact on key financial statement ratios and Altman"s failure prediction models as the conventional operating lease capitalisation method, except for certain debt-related and profitability ratios. Further results indicate that operating leases are used extensively and substantially more than finance leases within South Africa. It was also found that operating lease usage was positively related to company size, while finance lease usage decreased as company size increased. Curvilinear relationships were also noted between a company"s size and its extent of leasing. Further analysis revealed that recognised straight-lining lease provisions are substantially more material than recognised onerous lease contract provisions and are capable of distorting the analysis of operating lease capitalisation if ignored. When scrutinising loan covenants disclosed, it was established that none of the loan covenants were breached when capitalising operating leases; however, in each instance operating lease capitalisation negatively impacted all covenant related ratios.

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Chapter 1: Introduction

1.1. Background

Leasing is a major business activity that many entities engage in across the globe. This is clearly evident by the fact that new leases entered into worldwide, by the top 50 countries, during 2011 amounted to $724 billion according to White Clarke Group"s Global Leasing Report (White, 2013, p. 4). This was a record number and represented an increase of 21.9% from 2010. Not only is leasing a major business activity but it is also a growing means of obtaining the use of an asset[1].

Despite the top 10 countries, based on leasing volume, included in the Global Leasing Report representing 80% of the world"s leasing volume, there is a substantial volume of leasing activity within the South African economy, which is ranked 21st. The report indicates that South Africa is the top ranked African country, by volume, with an annual leasing volume of $5.7 billion in 2011 – representing a 13.7% increase on 2010 and 1.55% of South Africa"s gross domestic product. (White, 2013, pp. 6,14)

Leasing is therefore not only an important business activity globally but also within the South African economy. This is due to the many benefits that leasing offers as opposed to buying an asset, such as economies of scale or scope, increased flexibility, tax advantages, improved access to capital, reduced costs of upgrading equipment and improved risk sharing (SEC, 2005, p. 60). The Global Leasing Report (White, 2013, p. 4) also notes that leasing finance plays an important role "when credit, generally, is in short supply", in light of the increase in leasing volumes in recent years after the global financial crisis and subsequent increased lending restrictions imposed by financial institutions.

However, due to the current accounting approach adopted by accounting standard setters for leasing activities which classifies leases as either finance leases or operating leases, many leases (those classified as operating leases) are not reflected on the statements of financial position (hereon referred to as balance sheet) of entities. This is despite the fact that the required payments under a non-cancellable lease agreement, regardless of its accounting classification, are considered an obligation similar to loan repayments[1]. A 2005

[1] A lease is a contract whereby the owner of an asset (the lessor) gives another person (the lessee) the right to use the asset for a specified time in exchange for a specified payment. As such all lease agreements give the lessee the right to use an asset (which the lessor must provide) and create an obligation for the lessee to make future payments. A lease can therefore be likened to borrowing funds and buying an asset. As a result leasing provides entities with an alternative way of obtaining the use of an asset required to do business other than the conventional method of purchasing the asset, which is often performed by way of a loan.

Securities Exchange Commission (SEC) report estimated that there was $1.25 trillion in non-cancellable future cash obligations (undiscounted) committed under operating leases that were not reflected on the balance sheets of United States (US) issuers, but rather disclosed in the notes to the financial statements (SEC, 2005, p. 64). It is therefore evident that despite the many benefits and reasons for leasing; this benefit of obtaining off-balance sheet financing is another reason why entities enter into operating leases. This aspect of leasing has attracted much attention and been the focus of a significant number of research papers since the 1980s as outlined in Chapter 2 (Literature Review)[2]. An important aspect of this research has focused on the constructive capitalisation of operating (off-balance sheet) leases in order to determine the impact thereof on key financial statement figures and ratios. The results have all indicated, that for certain industries, operating leases have a substantial impact on financial statement figures and ratios when capitalised, most notably capital structure, liquidity and profitability ratios, as well as Altman"s failure prediction model.

Despite the extensive prior research referred to in Chapter 2, leasing is an under-researched area within the context of South Africa. This research report therefore aims to provide greater insight into leasing by South African listed companies with a focus on the impact that the constructive capitalisation of operating leases disclosed by these companies has on key financial statement ratios and Altman"s failure prediction model. This research is timely and particularly relevant in the context of the new proposed changes to lease accounting rules in terms of the International Accounting Standard Board (IASB) and Financial Accounting Standard Board"s (FASB) recently released exposure draft on leases (ED/2013/6) which proposes the capitalisation of all non-cancellable lease agreements entered into by lessees with a lease term of more than 12 months. Furthermore, this exposure draft classifies leases as either Type A or Type B leases, rather than the current categorisation of finance and operating leases, which will be investigated in this study. As previous research studies[3] indicate that the capitalisation of operating leases substantially impacts certain key financial ratios and Altman"s failure prediction model, this research is pertinent as the new proposed accounting treatment will change many of the reported figures and financial ratios that analysts, credit evaluators and other stakeholders rely on to make entity-related decisions. Loan covenants and capital structure decisions may also be impacted when capitalising operating leases.

[2] Examples of relevant research papers include Imhoff and Thomas (1988), Imhoff, Lipe and Wright (1991 & 1997), Ely (1995), Bennett and Bradbury (2003), Fulbier, Silva and Pferdehirt (2008), Jesswein (2009), Knubley (2010), Rauh and Sufi (2012) and Bratten, Choudhary and Schipper (2013).

[3] See for example Imhoff, Lipe and Wright (1991 & 1997), Bennett and Bradbury (2003), Fulbier, Silva and Pferdehirt (2008), Jesswein (2009) and de Villiers and Middelberg (2013).

1.2. Research Questions and Objectives

This research report extends and contributes to prior research relating to the impact of constructive capitalisation of operating leases in a number of ways, with a particular focus on South African listed companies in selected sectors considered to make the most use of leasing. The four research questions investigated and supporting objectives of this research study are noted below[4]:

1. Does constructive capitalisation of future non-cancellable operating lease commitments (x_1) have a significant impact on key financial statement ratios (y_1) and failure prediction indicators (y_2) of South African companies?

   Primary objective: To determine the impact that operating lease capitalisation has on key financial statement ratios and failure prediction indicators of South African companies and test the statistical significance thereof.

   Secondary objective: To build an appropriate operating lease capitalisation model, using company specific adjustments where possible, that takes into account the existing and proposed accounting treatment for operating leases.

2. Does the new proposed accounting treatment for Type A and Type B leases (x_2) have substantially the same impact on key financial statement ratios (y_1) and failure prediction indicators (y_2) as the conventional operating lease capitalisation method (x_1)?

   Secondary objective: To determine whether the proposed accounting treatment for leases yields the same results and has substantially the same impact on financial ratios and failure prediction indicators as the conventional operating lease capitalisation method.

3. Are operating leases used extensively and substantially more than finance leases in South Africa?

   Secondary objective: To determine the extent of lease usage in South Africa, most notably the extent of operating lease usage compared to finance lease usage.

[4] In the research questions *x* denotes an independent variable while *y* denotes a dependent variable.

4. Does the size of a company have an impact on the extent of lease (finance and operating) utilisation?

   Secondary objective: To determine whether smaller or larger companies make more or less use of either finance or operating leases.

As the financial statements of the selected companies were reviewed in order to collect the necessary data to capitalise operating leases and analyse the impact thereof, information relating to loan covenants was also collected, if disclosed. This was performed in order to determine whether the capitalisation of operating leases would result in the breach of any disclosed loan covenants.

1.3. Conclusion

Although the capitalisation of operating (off-balance sheet) leases has been the focus of many prior research papers, it remains an important area of research particularly within the South African context and in light of the new proposed accounting treatment for leases. As noted by Bennett and Bradbury (2003, p. 101), this line of research is therefore timely and relevant as it indicates the practical implications of decisions taken by accounting standard setters, most notably the impact on financial statement analysis. This research study also aims to address the fact that leasing is an under-researched area within South Africa through analysing the extent of leasing by South African listed companies based on the type of lease and the size of the company.

The remainder of this research paper comprises a review of appropriate literature and accounting rules in Chapter 2, followed by a chapter detailing the research methodology adopted, including the model developed and sample selected. Chapter 4 includes results of the data collected as well as analysis thereof, while Chapter 5 presents a summary of the research findings as well as a conclusion highlighting further areas of research.

Chapter 2: Literature Review

2.1. Introduction

Research on leasing has focused on a number of disparate areas; however, the main focus of this paper is concerned with the constructive capitalisation of operating leases. A review of prior leasing research indicated that capitalising operating leases has mainly been performed for the following reasons:

i. To determine the impact that capitalising operating leases has on the figures reported in financial statements and associated ratios (e.g. Imhoff, Lipe and Wright (1991 & 1997), Bennett and Bradbury (2003), Fulbier, Silva and Pferdehirt (2008), Durocher (2008) and Jesswein (2009));
ii. To establish whether market participants take *disclosed* future minimum lease payments into account in the same way as if operating lease liabilities were *recognised* in the balance sheet (e.g. Imhoff, Lipe and Wright (1993), Ely (1995), Beattie, Goodacre and Thomson (2000), Sengupta and Wang (2011), Dhaliwal, Lee and Neamtiu (2011) and Bratten, Choudhary and Schipper (2013)); and
iii. To determine the role of operating leases and analyse the impact thereof on corporate capital structure (e.g. Rauh and Sufi (2012)).

In line with the primary objective of this research paper, this literature review chapter focuses on research relating to the first point above in section 2.2.

Furthermore, lease accounting has evolved and been debated extensively over the past few decades. Certain research papers have focused on the changes in corporate behaviour as a result of amendments to the lease accounting rules (e.g. Imhoff and Thomas (1988) and SEC (2005)). Other research has merely focused on the principle of proposed changes in the accounting treatment of leases rather than numerical analyses of the impact thereof (e.g. Knubley (2010)). However, in line with the first point above, the majority of research in recent years has considered the likely impact of the proposed lease accounting changes to capitalise operating leases on financial statements and key financial ratios (e.g. Bryan, Lilien and Martin (2010), Grossman and Grossman (2010), Branswijck and Longueville (2011), Tai (2013) and de Villiers and Middelberg (2013)). Section 2.3 of this chapter provides greater detail on the accounting rules relating to lease accounting, proposed changes thereto as well as associated research.

Section 2.4 reviews literature on ancillary leasing issues, most notably the relationship between the size of entities and their propensity to lease, while section 2.5 provides concluding remarks concerning the literature reviewed.

2.2. Lease Capitalisation

A lease contract, regardless of its accounting classification, requires the lessee to make payment to the lessor in order to obtain the right to use the leased asset. This is in essence the same as the obligation that arises in terms of a loan whereby the funds borrowed need to be repaid in the future in terms of the loan agreement. Brigham and Daves (2010, p. 674), amongst others noted below, clearly support this view by way of the following succinct statement in their book in a section on the financial statement effects of leases: "leases should be regarded as debt".

Despite finance research papers (as mentioned in the introduction and sections 2.2.1 and 2.2.2) as well as accounting literature and research (referred to in section 2.3) advocating for many years that operating lease agreements should be capitalised, in order to correctly reflect the obligation and associated asset in respect of the lease, the capitalisation of all lease agreements has been advocated by many other parties. This includes the authors of recognised finance texts, such as Damodaran (2001, p. 83) and Correia, Flynn, Uliana and Wormald (2011, p. 7.21), who assert that the obligation to make payments in terms of a lease is akin to the repayments, including interest, due on debt. This is particularly relevant to operating leases which in terms of the current accounting rules are not reflected on the balance sheet.

Furthermore, according to Young (1999, pp. 10,15), adjusting accounting operating profit and invested capital for operating leases is one of the most commonly proposed adjustments in order to determine economic value added (EVA™)[5]. This is done in order to correct distortions in accounting numbers based on generally accepted accounting practices (GAAP) and brings operating leases onto the balance sheet as these leases are considered to be debt, albeit off-balance sheet for accounting purposes (Young, 1999, p. 9).

Altman"s original 1968 Z-Score failure prediction model was also revised to incorporate, amongst other reporting adjustments, the capitalisation of all non-cancellable leases that were not reflected as debt on the balance sheet (Altman, 2000, p. 25). The revised model, known as the ZETA® model[6], constructed in 1977 by Altman, Haldeman and Narayanan was

[5] EVA™ is a registered trademark of Stern Stewart & Company.
[6] The ZETA® model is a proprietary effort and therefore exact details thereof, such as discriminant coefficients and independent variables, are not publically available.

found to be consistently more accurate as a leading indicator of impending financial distress 2 to 5 years prior to bankruptcy than the original Z-Score model (Altman, 2000, p. 31).

When considering credit evaluations by lenders, Wilkins and Zimmer (1983, p. 761) found that loan officers do not respond differently to different methods of fixed asset financing or reporting of finance leases (recognition versus disclosure), indicating that lenders understand the leverage implications of alternative methods of lease accounting and capitalise finance leases if disclosed and not recognised in the balance sheet. However, the research by Wilkins and Zimmer ignored operating leases by only focusing on finance leases. In contrast, when considering loan covenants and operating leases, El-Gazzar, Lilien and Pastena (1989, pp. 226-228) found that lending agreements generally did not require the capitalisation of operating leases and therefore entities can use operating leases, off-balance sheet financing, to circumvent debt restrictions. However, it was found that lenders nonetheless protected themselves against off-balance sheet financing through implementing other restrictions such as prohibiting additional leases or sale and leaseback transactions (El-Gazzar, et al., 1989, p. 230). Essentially loan covenant limits are set by lenders with full knowledge of existing operating leases and the obligation they create (Lightner, et al., 2013, p. 19). Furthermore, research by Krishnan and Sengupta (2011, pp. 145-146) found operating (off-balance sheet) leases to be positively and significantly associated with audit fees and going-concern opinions. This further supports the fact that off-balance sheet operating leases contribute to greater financial risk as auditors view them as real liabilities.

Based on the aforementioned literature and a non-cancellable lease being similar to a loan, capitalising off-balance sheet operating leases is necessary in order to recognise the obligation to make future lease payments. Section 2.2.1 provides details on the lease capitalisation methods used in prior research, while the results thereof are covered in section 2.2.2.

2.2.1. Lease Capitalisation Methods

The vast majority of research conducted requiring the capitalisation of operating leases has used the constructive capitalisation method developed by Imhoff, Lipe and Wright (1991 & 1997), referred to hereafter as the „ILW method". In their 1991 seminal paper Imhoff et al. discounted the future minimum lease payments disclosed in respect of operating leases using an estimate of the entity's incremental pre-tax borrowing rate in order to determine the unrecorded lease liability. An estimate of the remaining and total useful life of the leased asset was also required in order to estimate the accounting value of the unrecorded asset which, based on straight-line amortisation, would be less than the unrecorded liability[7]. This is illustrated by way of Example 2.1.

[7] It is to be noted that from an economic perspective the leased asset's economic value would generally be greater than the associated liability value during the lease term due to the future economic benefits expected to be generated from the productive use of the leased asset. If this was not the case then an entity would not enter into a lease agreement. An alternative method advocated to determine the amortisation charge is present value amortisation (also known as economic or annuity depreciation) where the annual amortisation effectively increases over the lease term and equals the capital reduction in the lease liability – see study by Jennings and Marques (2013) who compare straight-line amortisation with present value amortisation. However, from an accounting perspective, based on the leased asset value equalling the lease liability at inception and straight-line amortisation, the leased asset's accounting value will always be less than the associated liability. Accounting value is important in the context of this research study, namely the impact of the constructive capitalisation of operating leases on annual financial statements prepared in accordance with GAAP and financial accounting ratios based thereon.

***EXAMPLE 2.1*: Analysis of Lease Liability, Leased Asset and Related Expenses**

The use of an asset is obtained for 5 years in terms of a non-cancellable operating lease agreement that requires annual lease payments of R100 000, in arrears. Assuming the appropriate before tax discount rate is 12%, the present value of the lease payments equals R360 477.62 at inception of the lease. If no other costs are incurred in connection with the lease then the leased asset value also equals R360 477.62 at inception resulting in an annual straight-line amortisation charge of R72 095.52 (360 477.62 ÷ 5) over the 5 year lease term. Based thereon the lease liability and asset balances will be as presented in Table 2.1(a) and Graph 2.1(a) at each year end. The consequential interest and amortisation charges relating to the capitalised (on-balance sheet) operating lease are presented in Table 2.1(b) and Graph 2.1(b) and compared to the recognised operating lease expense (off-balance sheet).

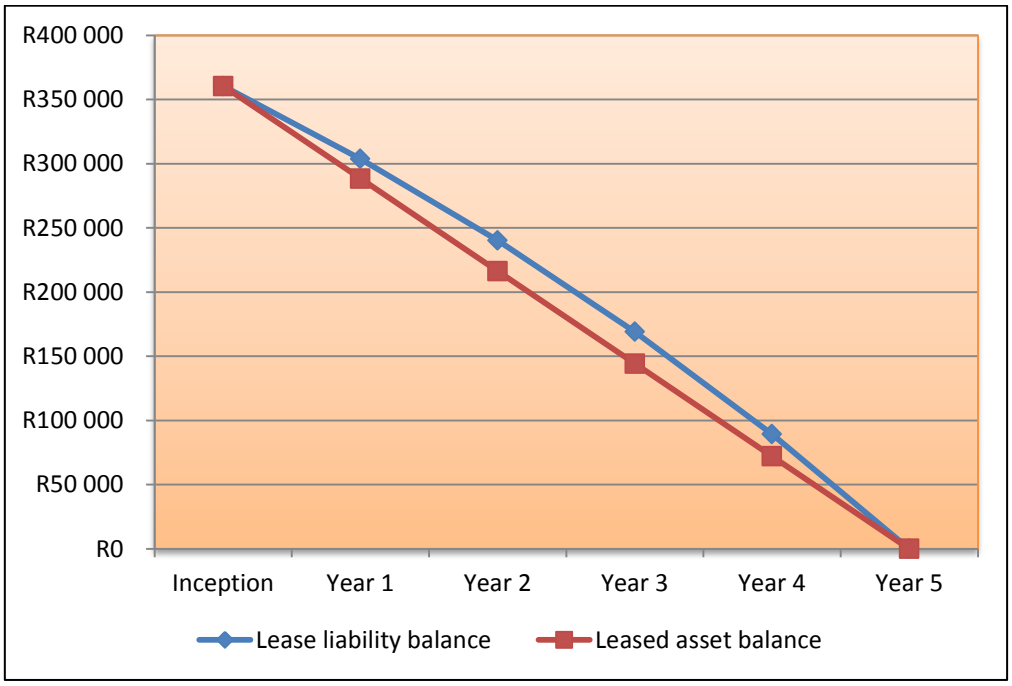
Table 2.1(a): Liability and asset balances under a lease

	Lease liability balance (R)	Leased asset balance (R)	Ratio of leased asset to lease liability
Inception	360 477.62	360 477.62	100.0%
Year 1	303 734.93	288 382.10	94.9%
Year 2	240 183.13	216 286.57	90.1%
Year 3	169 005.10	144 191.05	85.3%
Year 4	89 285.71	72 095.52	80.7%
Year 5	-	-	-

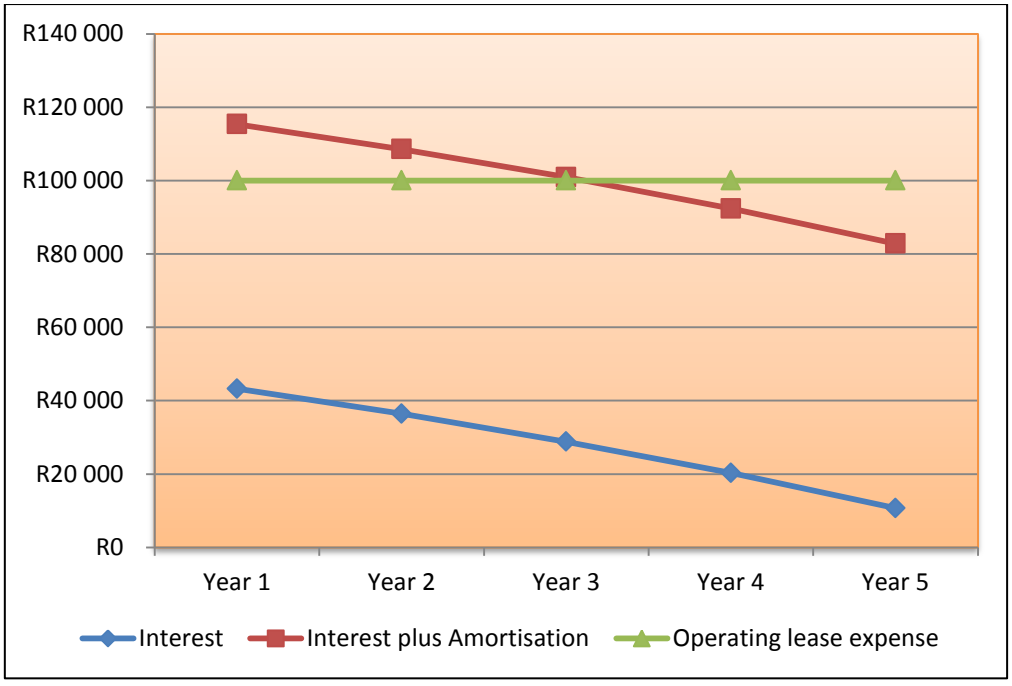
Table 2.1(b): Lease expenses – on-balance sheet versus off-balance sheet

	On-balance sheet expenses		Off-balance sheet expense
	Interest expense on lease liability (R)	Amortisation on leased asset (R)	Operating lease expense (R)
Year 1	43 257.31	72 095.52	100 000.00
Year 2	36 448.19	72 095.52	100 000.00
Year 3	28 821.98	72 095.52	100 000.00
Year 4	20 280.61	72 095.52	100 000.00
Year 5	10 714.29	72 095.52	100 000.00

Graph 2.1(a): Liability balance relative to asset balance over lease term



Graph 2.1(b): Lease expenses – on-balance sheet versus off-balance sheet



The unrecorded asset ratio (ratio of leased asset to lease liability as reflected in the fourth column of Table 2.1(a) in Example 2.1) can be determined using the following formula presented by Imhoff et al. in Table 3 of their research paper (1991, p. 56):

$$Asset\ ratio = (RL \div TL) \times \{(PVA_{TL,i}) \div (PVA_{RL,i})\}$$

Where, $RL =$ *remaining life of lease*

$TL =$ *total life of lease*

$PVA_{TL,i} =$ *present value of an annuity for TL at i%*

$PVA_{RL,i} =$ *present value of an annuity for RL at i%*

$i\% =$ *marginal borrowing rate*

As an example illustrating the accuracy of the above formula, the asset ratio of 85.3% at the end of Year 3 in Example 2.1 has been calculated using this formula as indicated below:

$$Asset\ ratio = (2 \div 5) \times \{(PVA_{5,12\%}) \div (PVA_{2,12\%})\}$$

$$= (0.4) \times (3.605 \div 1.690)$$

$$= 85.3\%$$

The underlying assumptions of the asset ratio formula are that 1) leased assets are amortised on a straight-line basis, 2) the leased asset and lease liability are equal at the start of each lease and 3) the leased asset and lease liability are both zero at the end of each lease. The difference between the unrecorded liability and unrecorded asset relating to operating leases results in an adjustment to equity (decrease) and deferred tax for accounting purposes. This arises from the lease expense recognised initially being less than the sum of the interest on the unrecorded lease liability and the amortisation on the unrecorded leased asset (refer to Table 2.1(b) and Graph 2.1(b) in Example 2.1). The 1991 paper by Imhoff et al. assumed that the current year impact on profit was not material and therefore zero (1991, p. 59). In addition, five uniform assumptions were also made by Imhoff et al. when capitalising the operating leases for their sample of companies, namely: an interest rate of 10% was appropriate for each company; the average remaining life of operating leases was 15 years; all minimum lease payments were expected to occur at year end; the asset ratio equalled 70% (rule of thumb suggested by Imhoff et al.); and the effective tax rate was 40%. These assumptions were employed in order to isolate the impact of changes in any of the assumed variables and determine the impact of capitalising

operating leases solely attributable to differences in the future minimum operating lease payments of the companies (Imhoff, et al., 1991, p. 61).

However, Imhoff et al. (1997) reconsidered some of these assumptions and provided evidence that the impact of capitalising operating leases on standard profitability measures such as operating income margin, return on assets (ROA) and return on equity (ROE) can be substantial as well as unpredictable in direction (1997, p. 31). The profit impact was determined by adding back the operating lease expense and deducting the interest on the unrecognised lease liability as well as the amortisation on the unrecognised leased asset. [As a result of the interest plus amortisation being greater than the operating lease expense in the initial years, profit will be lower when capitalising operating leases, while the opposite will occur in the latter years of the lease – refer to Graph 2.1(b) in Example 2.1 for an illustration thereof. Hence the impact on profit is unpredictable in direction as noted by Imhoff et al. as it can be negative or positive depending on the phase of the lease.] All these adjustments were performed on an after-tax basis. Furthermore, Imhoff et al. indicated that the overall net profit impact can be determined, without calculating the separate income statement adjustments, as the movement in equity (retained earnings) if the balance sheet impact in the current and comparative year has been determined (1997, p. 21). They also reconsidered the assumptions in their 1991 paper relating to the constant interest rate of 10% used and the average remaining life of 15 years assumed for operating leases. Two proxies were suggested as an appropriate entity-specific interest rate (lessee incremental borrowing rate), namely:

i. The interest rate implicit in the entity"s capital (finance) leases – this may be disclosed or can be determined from required finance lease disclosures. Imhoff et al. used this method but noted that with operating leases more ownership risk remains with lessors, therefore a higher interest rate is most likely applicable for operating leases compared to finance leases.
ii. The interest rate implicit in the entity"s recognised debt – this may also be disclosed or can be determined as interest expense divided by the book value of all interest bearing debt. In this instance, Imhoff et al. note that interest expense must not be net of interest income. (Imhoff, et al., 1997, p. 17)

Furthermore, Imhoff et al. used a method that was suggested in their 1991 paper to estimate the average remaining lease life for each company analysed in their 1997 paper. This involved dividing the future minimum lease payments due after five years by the minimum lease payments due in the fifth year and rounding the result up (they also suggested adding one or two years if the result was greater than fifteen) due to the fact that future minimum lease payments generally decline as lease agreements come to an end (Imhoff, et al., 1997,

p. 17). This estimate was then used to further estimate the minimum lease payments due annually after five years (equal to the future minimum lease payments due after five years divided by this estimate), the discounted lease liability as well as the asset ratio.

The ILW method was based on the operating lease disclosures required under US GAAP (FAS 13) whereby the future minimum operating lease payments due in each of the next five years must be disclosed together with the aggregate of lease payments due thereafter. However, in terms of International Accounting Standard (IAS) 17 paragraph 35 the total of future minimum lease payments due later than one year and not later than five years after year-end are required to be disclosed as a lump sum (IASB, 2012, p. A646). Fulbier, Silva and Pferdehirt (2008, p. 127) therefore used a geometric degression model to convert the total amount disclosed in terms of IAS 17 for future minimum lease payments due later than one year and not later than five years after reporting date into annual lease payments that decline at a constant rate. The model calculated a constant degression factor (*dg*) which ensured that the minimum lease payment (*MLP*) of the next period equalled the prior period *MLP* multiplied by *dg*. Furthermore all of the *MLPs* calculated using the degression model for the four year period (after one year and not later than five years from reporting date) sum to equal the total amount disclosed for the same period. However, other researchers (e.g. Bennett and Bradbury (2003, p. 106) and Branswijck and Longueville (2011, p. 282)) followed a simplified approach of dividing the lump sum future minimum lease payments by the specified time period to get an equal annual lease payment. The geometric degression model used by Fulbier et al. is considered superior and more accurate as future minimum lease payments generally decline in future years as lease contracts expire. This is supported by de Villiers and Middelberg (2013) who used the ILW method incorporating the degression model used by Fulbier et al. when analysing the impact of constructive capitalisation within South Africa[8].

Beattie, Edwards and Goodacre (1998), together with Fulbier et al. (2008) and Durocher (2008), made a number of other entity-specific adjustments when capitalising operating leases using the ILW method and restating reported figures for each entity in their sample whenever possible (e.g. average remaining lease life, tax rates, discount rates). This results in the calculation of a far more accurate lease liability and leased asset for each entity in respect of off-balance sheet operating leases. These entity-specific adjustments have not been considered in many other research studies which mainly used the uniform assumptions used by the original ILW method to determine the unrecognised operating lease liability and associated asset. Cornaggia, Franzen and Simin (2013, p. 348) argued that an entity-

[8] Listed South African companies also report in terms of International Financial Reporting Standards issued by the IASB, most notably IAS 17 for leases.

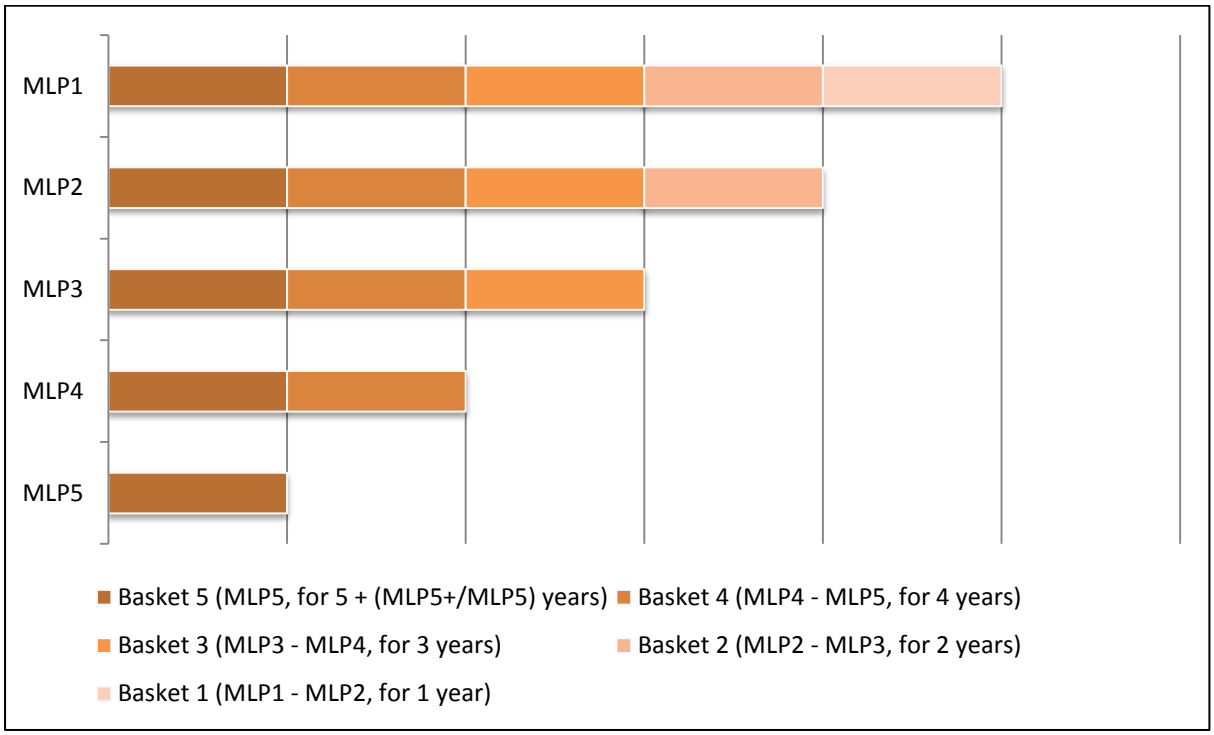
specific discount rate should not be used as it gives entities with more debt the benefit of higher discount rates (i.e. lower liability values); however, this is not considered appropriate as a higher discount rate correctly incorporates the higher risk associated with more debt (financial risk). Essentially the lease payments would correctly include a greater interest component due the higher risk a lessor is exposed to when compared to leasing to another entity with lower levels of debt. It is however acknowledged that the lessor holds a put option (i.e. the right to sell the leased asset if the lessee does not pay the required lease rental) which also has a bearing on the level of risk borne by the lessor and is based on the type of asset leased. The extent of this risk is largely dependent on the specialised nature of the leased asset and will also be factored into the interest rate charged by the lessor; however, this cannot be determined based on financial statement disclosures.

Furthermore, Fulbier et al. (2008) did not determine the leased asset from the aggregate of the discounted future lease payments (total lease liability) as per the ILW method but rather from the present value of the future minimum lease payments split into five contract baskets, each with a different remaining life from one year up to five or more years. Fulbier et al. (2008, p. 130) identified each basket "by using MLP_t - MLP_{t+1} but assume(d) that the fifth basket ha(d) equal annual payments to MLP_5 with a remaining lifetime of 5+ (MLP_{5+}/MLP_5)". The difference between the *MLPs* (i.e. MLP_t - MLP_{t+1}) in two consecutive years was assumed to be the *MLP* of lease contracts coming to an end at *t* (i.e. the first of the two consecutive years). The ILW method"s asset ratio is subsequently applied separately to each basket before aggregating the results to determine the value of the leased asset. Fulbier et al. (2008, p. 130) note the following in support of this adapted method:

- Consistency with the general assumption of constant lease payments when applying the ILW constructive capitalisation method;
- Information in the annual financial statements is used more effectively through capturing the full range of remaining lives of the underlying lease contracts; and
- Shorter lease lives are incorporated leading to a more conservative approach (i.e. higher leased asset values due to the shorter lease lives) and this consequently avoids an overstated impact on equity which increases with increasing remaining lease lives.

Graph 2A illustrates how the abovementioned lease contract baskets were determined by Fulbier et al. Although this adapted method has not been extensively used in subsequent research it is nonetheless considered a merited improvement to the ILW method due to it conceptually improving the accuracy with which the leased asset value is determined.

Graph 2A: Illustration of Fulbier et al.'s (2008) lease contract baskets



A second ad hoc constructive capitalisation method used by bond-rating agencies is noted by Imhoff et al. (1993, p. 341) and Dhaliwal, Lee and Neamtiu (2011, pp. 179-180) – this method recognises a lease liability and asset equal to the current period operating lease expense multiplied by eight. Further, although no impact on net income is assumed, interest expense on the lease liability is estimated to equal one-third of the operating lease expense while the remaining two-thirds are reclassified as depreciation (amortisation) expense relating to the leased assets. There is no theory or empirical evidence to support this method and research results by Imhoff et al. (1993, pp. 346-347) indicate that it overestimates the operating lease liability in comparison to the ILW method. Ely (1995, pp. 402-403) used a similar method whereby the lease liability was estimated to equal the future minimum lease payment disclosed in respect of the first year multiplied by a constant of six – this constant is derived using present-value formulas assuming a lease term of 25 years and an interest rate of 10%. Subsequent research has found that both of these rule of thumb heuristic methods (multiplying by a constant of eight or six) overstate the lease liability in comparison to the ILW method (e.g. Beattie, Goodacre and Thomson (2000, p. 1203), Bennett and Bradbury (2003, p. 108) and Jesswein (2009, p. 87)). Another heuristic approach was evaluated by Jesswein (2009, p. 86) which multiplied "all current and future lease obligations by two-thirds, with one-third of each year's payment representing the financing cost of leases for that year". Although this method understated the lease liability relative to the more

sophisticated ILW method, it was found to have a higher correlation with the ILW method results and also give a more accurate approximation of the lease liability when compared to the other two rule of thumb heuristic methods (Jesswein, 2009, p. 87).

A further simplistic method was used by Grossman and Grossman (2010) whereby information pertaining to finance leases was utilised. They used a median ratio of the selected companies, obtained by dividing the present value of finance leases by the undiscounted amount disclosed in respect of those leases, equal to 67%. This constant median ratio was then applied to the undiscounted future minimum operating lease payments disclosed for all companies in the sample in order to determine the unrecognised operating lease liabilities. Grossman and Grossman noted that this method was a limitation of their study. (Grossman & Grossman, 2010, pp. 9,11)

Recent research performed by Bratten, Choudhary and Schipper (2013, p. 1194) confirmed the reliability of the ILW method by applying the method to disclosed finance lease payments for 565 entity-years. Bratten et al. discounted the finance lease payments at an implied interest rate and compared the result to the recognised finance lease obligations which proved the accuracy and reliability of the ILW method. Furthermore, the ILW method has been used extensively without any major adaptations (e.g. Bennett and Bradbury (2003), Duke and Hsieh (2006), Jesswein (2009), Bryan et al. (2010) and Branswijck and Longueville (2011)), confirming support of the underlying principles and assumptions as well as the accuracy of this method of constructively capitalising operating leases. The constructive capitalisation model developed in Chapter 3 is therefore based on the ILW method.

2.2.2. Results of Lease Capitalisation from Prior Studies

This section focuses on the impact that capitalising operating leases has on financial statements and ratios as well as Altman"s failure prediction model based on documented operating lease capitalisation research results. It also summarises research findings relating to industries within which the use of operating leases has been found to be most prevalent.

2.2.2.1. Financial Statements and Ratios

Imhoff et al. (1991) applied their constructive lease capitalisation (ILW) method to a sample of seven pairs of listed US entities in different industries with a set of uniform assumptions – the pair in each industry consisted of an entity that had a high ratio of future minimum lease payments relative to total assets (high lessee) as well as an entity of similar size where this

ratio was substantially lower (low lessee). Ignoring the income statement effects of constructive capitalisation, Imhoff et al. found that the ROA decreased on average by 34% and 10% for high lessee and low lessee entities respectively. Furthermore the debt-to-equity ratio (D/E) increased on average by 191% for high lessees compared to 47% for low lessees. (Imhoff, et al., 1991, p. 61)

The 1997 paper by Imhoff et al. considered the income statement effects of constructive capitalisation and focused on a limited sample of four US entities in order to explain the necessary adjustments to operating income and net income. The financial statement ratios used by Imhoff et al. included operating income margin, ROA and ROE, all of which changed as a result of capitalising operating leases. (Imhoff, et al., 1997, pp. 26-29)

Beattie et al. (1998, p. 245) found that for a sample of 300 listed United Kingdom (UK) companies, on average, the unrecorded operating lease liability represented 39% of reported long-term debt, while the unrecorded leased asset represented 6% of total assets. In this study, considering paired *t*-test results, capitalising operating leases was found to have a significant impact on the following ratios (with average relative change noted in brackets): profit margin (+12.1%), ROA (-10.8%), asset turnover (-12.5%) and three measures of gearing (e.g. D/E +48.7%). Beattie et al. (1998, p. 251) also found the Spearman rank correlation between the ratios before and after capitalisation changed substantially in certain instances, especially with the gearing ratios.

Research performed by Bennett and Bradbury (2003) on a sample of 38 listed entities in New Zealand (effectively all listed entities with operating leases) indicated an average increase in total liabilities and total assets of 22.9% and 8.8% respectively with a corresponding mean decrease in equity of 3.0% (Bennett & Bradbury, 2003, p. 110). In their research, Bennett and Bradbury analysed the impact of constructive capitalisation on three ratios, namely the leverage (debt) ratio (total debt to total assets, denoted as D/A), current ratio and ROA. The impact on the current ratio was an important development as the operating lease liability can be divided into a current portion (payments due within one year) and a long-term portion (payments due after one year) (Bennett & Bradbury, 2003, p. 102). This is supported by subsequent research that also analysed the impact of capitalising operating leases on current liabilities and the current ratio e.g. Grossman and Grossman (2010, pp. 10-11).

Subsequently Fulbier et al. (2008) performed an extensive analysis of the impact of operating lease capitalisation on the financial ratios of 90 listed German companies selected from three major indexes (DAX30, MDAX and SDAX). Three broad areas of financial ratios were analysed, namely “ratios displaying the structural changes in the balance sheet”, ratios

indicating “changes in the profitability and the interest expense structure” and ratios indicating entity “valuation from the capital market perspective”. After adjusting for the operating leases, Fulbier et al. (2008) found that the balance sheet structure of entities changed considerably (e.g. D/E increased on average by 22%) while profitability ratios indicated relatively small changes (e.g. ROA increased by an average of 0.1%). However, the increased interest expense resulted in a more substantial change (a mean decrease of 13.8%) in the times interest earned ratio. Furthermore, market ratios, analysing the impact on entity valuation, were only slightly affected with small percentage changes as with profitability ratio changes. Fulbier et al. concluded that their results were in line with prior studies. (Fulbier, et al., 2008, pp. 132-135)

Durocher (2008) performed similar research as Fulbier et al. (2008) on a sample of 68 Canadian public companies and found that the average D/A ratio increased by 4.1%, while the average current ratio decreased by 5.1% (these ratios are noted as the change that occurred was significantly different from zero at the 1% level (*t*-test)). The operating lease capitalisation for this sample of Canadian companies resulted in an average increase in unrecorded operating lease liabilities and leased assets of 11.5% and 5.6% respectively. (Durocher, 2008, pp. 244-246)

Jesswein (2009) performed an extensive analysis of the impact of operating lease capitalisation on various financial ratios of 595 US listed non-financial companies that disclosed operating lease commitments. The study found that substantial differences in financial ratios arose which were all significant beyond the 99th percentile e.g. mean current ratio decreased by 13.8%, mean times interest earned decreased by 78.5%, mean D/A increased by 72.7% and mean ROA decreased by 28.6% (Jesswein, 2009, pp. 83-84).

Research conducted on a sample of 31 Dutch companies and 35 Belgium companies by Branswijck and Longueville (2011, pp. 284-285) indicated an average increase in total liabilities and total assets of 5.8% and 3.0% respectively. This resulted in significant differences, based on the results of a paired sample *t*-test, in the D/E ratio (average increase of 8.4%) and the current ratio (average decrease of 3.5%) while the ROA remained constant on average at 9%. Although these differences were statistically significant, they are small in comparison to other studies, most notably Jesswein (2009), despite both studies only including companies with disclosed operating leases. This may be an indication that the extent of operating lease usage by Dutch and Belgium companies is less than that of US companies.

A research paper by Tai (2013) focused on the impact that constructive capitalisation of operating leases on two large Hong Kong fast-food restaurant chains (Fairwood and CDC)

that made extensive use of operating leases. The results indicated substantial changes for both companies – a decrease in ROA for Fairwood (CDC) from 16.2% to 5.2% (14.3% to 6.9%) and an increase in D/E from 69% to 1,417% (23% to 241%). These large changes were based on a discount rate of 6% and arose due to a number of factors particular to Hong Kong noted by Tai, such as the low interest rate environment, high property prices and companies being conservative with regards to their use of debt. (Tai, 2013, pp. 130,138)

As previously noted, leasing is an under-researched area within South Africa. However, de Villiers and Middelberg (2013) followed the approach adopted by Fulbier et al. (2008), calculating ratios within the same three broad areas (categories) relating to structural change, profitability and market value within a South African context. De Villiers and Middelberg selected a sample of 29 companies within the Johannesburg Stock Exchange (JSE) Top 40 index that disclosed information relating to operating leases. Although their findings indicated substantial changes in the ratios analysed pre- and post-adjustment for operating leases, the changes were generally smaller than those identified by Fulbier et al. e.g. on average D/E increased by 9% and times interest earned decreased by 8% (de Villiers & Middelberg, 2013, p. 663) compared to the 22% increase and 13.8% decrease noted by Fulbier et al. Although no reasons were noted by de Villiers and Middelberg, these differences are likely due to the JSE Top 40 index including very few companies that operate in sectors that are likely to make substantial use of operating leases such as transport, leisure, entertainment and hotels, food and drug retailers and general retailers (as at 15 August 2013 only five of the companies included in the JSE Top 40 index operated in these sectors (Reuters, 2013)). Although this conclusion is congruent with section 2.2.2.3, it is noted that there could be many other reasons for the differences identified such as the size of the companies in the respective samples and the cost of leasing in relation to other debt finance in South Africa. However, contrary to Fulbier et al. (2008), de Villiers and Middelberg noted substantial changes in profitability and market ratios when capitalising operating leases for their sample of companies (de Villiers & Middelberg, 2013, pp. 664-666).

In a larger and more recent study in the US, Cornaggia et al. (2013) analysed 23,962 entity-years from 1980 until 2007 and found that the D/A ratio increased from an average of 26% to 30-36% when capitalising operating leases. This adjustment was also generally found to improve the ROA of profitable entities while the opposite was true for entities with negative earnings (Cornaggia, et al., 2013, p. 354). Furthermore, Jennings and Marques (2013, p. 67) found that the variation (measured by the standard deviation) of three ratios (ROA, asset turnover and D/A) within industries declined substantially when operating leases were constructively capitalised. This result indicated that the comparability of financial results

within an industry are improved when operating leases are capitalised based on their analysis of 34,707 US entity-year observations from 1998 to 2008.

Essentially the common finding that results from constructive capitalisation of operating leases is that liabilities increase, with assets increasing to a lesser extent and the difference being a decrease in equity as well as an adjustment to deferred tax. Furthermore, profit in a given year can increase or decrease depending on the average age of the operating leases. The consequential impact on financial ratios is that leverage ratios increase, the current ratio and times interest earned decreases, while profitability ratios can remain unchanged or change in either direction.

2.2.2.2. Failure Prediction

Further to the conventional financial ratio analyses performed by previous researchers noted in the preceding section, Jesswein (2009) also assessed the impact that constructive capitalisation of operating leases may have on the failure prediction indicators (creditworthiness) of companies through examining the changes that result in Altman"s Z-score (a multiple discriminant analysis model based on a variety of financial ratios). The results indicated that the average Z-score would decrease by 26.3% and almost one-quarter of the companies that were considered unlikely to fail would not be considered so anymore if their operating leases were capitalised due to a decrease in their Z-score (Jesswein, 2009, pp. 83-84). This is considered an important contribution as it further assists in analysing the impact of operating lease capitalisation, especially with respect to assessing the creditworthiness or bankruptcy risk of an entity.

Cornaggia et al. (2013, p. 355) performed a similar analysis on their larger sample of 23,962 entity-years and found that 11.7% of the sample would be classified as riskier (i.e. placed in a lower zone based on their Z-score) if operating leases were recognised as debt. Both Jesswein (2009) and Cornaggia et al. (2013) based their analysis on Altman"s original failure prediction model developed in 1968 due to it being the most well-known model and a stable proxy for bankruptcy risk in empirical research studies. This model essentially calculates a Z-score (Z) as the weighted average of five specified accounting ratios, namely: working capital to total assets (X_1), retained earnings to total assets (X_2), earnings before interest and taxes to total assets (X_3), market value of total equity to book value of total liabilities (X_4) and total sales to total assets (X_5) expressed as follows (Altman, 2000, p. 14):

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$$

The higher the calculated Z-score is, the lower the probability that the entity will experience financial distress or be forced into liquidation. Furthermore, a Z-score greater than 2.99 indicates that the entity is unlikely to fail (low bankruptcy risky) while a Z-score less than 1.81 is an indication that the entity is likely to fail (high bankruptcy risk). A Z-score between 1.81 and 2.99 falls within a zone of uncertainty. (Altman, 1968, p. 606)

If an entity"s Z-score decreases as a result of capitalising operating leases it is not more risky than it was prior to the lease capitalisation adjustment as the operations and method of financing of the entity have not changed through such an adjustment (i.e. it is merely a book adjustment). This is an obvious observation but is nonetheless important. Essentially the capitalisation of operating leases within the context of failure prediction aims to present a more reliable Z-score incorporating the additional financial risk of off-balance sheet debt. The fact that the original Z-score model of Altman was developed based on accounting numbers that did not capitalise operating leases is noted as a limitation of such studies; however, this analysis is nonetheless relevant as it provides valuable insight into the impact of operating lease capitalisation in the context of failure prediction and enables enhanced comparison of entities with differing leasing propensities. This is particularly important in light of the growth in lease financing since the original Z-score was devised in 1968. Furthermore, detailed information on the revised ZETA® model, which incorporates an adjustment capitalising all non-cancellable leases, is not publically available for use in research studies.

Based on the abovementioned findings it is evident that capitalising operating leases leads to a reduction in the average Z-score for companies through the inclusion of off-balance sheet financial risk.

2.2.2.3. Industry Analysis

In their 1991 paper Imhoff et al. selected listed entities within seven industries considered to have a large amount of long-term operating leases, namely home furnishings, food stores, fast food, semi-fast food, clothing, drug/food stores and airlines (1991, pp. 60-62). Subsequently another two papers by Imhoff et al. (1993, p. 344 & 1997, pp. 26-30) focused only on two of the seven industries mentioned above, namely airlines and groceries (food retailers). In their 1997 paper they also note that entities in certain industries such as “airlines, retail groceries, retail clothing chains, fast-food restaurant chains, hotel and motel chains, railroad and trucking” make extensive use of operating leases (Imhoff, et al., 1997, p. 31). This statement was confirmed by Beattie et al. (1998, pp. 247-249) who found that, based on a sample of 300 UK companies spread across various sectors, the services sector,

which includes retailers, hotels and vehicle distributors, was impacted the most through operating lease capitalisation.

Furthermore Duke and Hsieh (2006, p. 46) focused on six entities identified as major users of operating leases by a *Wall Street Journal* article published in 2004 – this sample included a railroad operator, two drug retailers, a supermarket chain and two airlines. All of these entities fall within the industries noted by Imhoff et al. in their research.

The sample of 90 listed German entities selected by Fulbier et al. (2008) was separated into seven industry groups with fashion and retail indicating the most substantial changes in almost all financial ratios, indicating extensive use of operating leases by entities in these industries (Fulbier, et al., 2008, pp. 138-139). The other five industry groups where operating lease usage was found to be less were as follows: chemical, drugs and healthcare; construction and assembly; natural resources and energy; others; services.

Durocher"s (2008, pp. 245-247) sample of 68 Canadian public companies indicated that the most substantial change occurred in the debt ratio for two industries, namely merchandising and lodging as well as industrial products. The remaining four industries (communications and media; financial services; oil and gas; utilities) experienced a small percentage change in the ratios examined. Similarly, research conducted by Bryan et al. (2010, pp. 39-40) on a substantial sample of US listed companies over the period from 2000 to 2008 indicated that the retail, transportation and services sectors were the most affected when capitalising operating leases. The retail sector was impacted the greatest with the average ROA decreasing almost 30% and the average D/E ratio increasing by 75.7%. Other sectors that were less impacted by the operating lease adjustments comprised communications, financial services, manufacturing, petroleum and utilities.

Grossman and Grossman (2010, p. 8) also found that the companies most affected by their adjustments when analysing the impact of unrecorded operating lease liabilities on current liabilities included retailers, fast-food and transportation companies. Furthermore research findings by Branswijck and Longueville (2011, p. 286) indicate that the retail and transport (including travel and leisure) industry in Belgium and the Netherlands was the most affected, with an average increase in the D/E ratio of 31.1%, when capitalising operating leases. Recently, an analysis by Jennings and Marques (2013, p. 61) found that from 1998 to 2008 the US retailing (58.3%), consumer services (38.7%) and transportation (24.9%) industries had the largest ratio of expected future lease payments to total assets (indicated in brackets).

In summary, the above research results indicate that the industries suggested by Imhoff et al. (1997, p. 31) do indeed make the most extensive use of operating leases – summarised

as retailers, restaurants, hotels and transportation. Furthermore, Durocher (2008) also established that the industrial products industry made substantial use of off-balance sheet debt.

2.3. Lease Accounting

The current accounting treatment for leases, based on a risk and reward model classifying lease agreements as either finance leases or operating leases, was introduced by the FASB in 1976 as US GAAP (FAS 13: Accounting for Leases) and by the IASC (International Accounting Standards Committee, the predecessor body of the IASB) in 1982 (IAS 17: Accounting for Leases). This accounting treatment requires the capitalisation of all finance leases while information relating to operating leases is merely disclosed in the notes to the financial statements. (Joint International Working Group on Leasing, 2007)

The lease capitalisation debate for accounting purposes and the classification of lease agreements into finance leases and operating leases has been the focus of a vast amount of research over a number of decades. Prior to the current accounting treatment some leases were capitalised; however, most finance leases were not capitalised but rather disclosed in the financial statement notes (Imhoff & Thomas, 1988, p. 279) with lessee payments made in respect of these leases expensed when incurred. Imhoff and Thomas (1988, p. 305) provided evidence that the use of finance leases declined sharply when the current accounting treatment was introduced, largely due to substitution into operating leases. Furthermore, El-Gazzar and Jaggi (1997, p. 306) found that most entities whose debt covenants were based on GAAP and had a greater proportion of off-balance sheet debt, opted to adopt the current accounting treatment for finance leases later than other entities (early adopters) and that those entities (late adopters) issued more equity capital and renegotiated or redeemed debt to a greater extent than early adopters during the transition period. This indicates that late adopters took remedial actions to reduce the negative impact of the new accounting treatment which required the capitalisation of finance leases. According to Durocher (2008, p. 230) evidence suggests that Canadian and American companies prefer classifying lease agreements as operating leases as they are then not capitalised (off-balance sheet) and therefore any potential debt covenant violations or any adverse impact on incentive compensation resulting from capitalising leases can be avoided.

The fact that operating leases are used extensively and substantially more than finance leases was confirmed by a 2005 SEC report (SEC, 2005, p. 64) that estimated, based on empirical research and an estimated population of 10,100 US issuers, the undiscounted cash flows committed under operating leases to be almost 28 times more ($1.25 trillion) than

the estimated undiscounted cash flows committed under capital (finance) leases ($45.1 billion). Based on these findings, the SEC recommended that the FASB, together with the IASB, re-examine lease accounting. Beattie et al. (2000, p. 1187), in line with findings by Callimaci, Fortin and Landry (2011, p. 277), also note that based on research they performed on a sample of UK listed companies, the unrecognised liability in respect of future minimum operating lease payments was approximately 13 times more than the liability recognised in respect of finance leases. Recently, on a larger scale, Cornaggia et al. (2013, p. 349) analysed US entity data from 1980 until 2007 and found that off-balance sheet operating lease liabilities increased as a proportion of total debt by 745% while the same ratio for on-balance sheet finance lease liabilities decreased. As limited information is available in this respect, especially in the South African context, the same is likely to have occurred in South Africa since similar accounting rules are in place in terms of IAS 17.

Prior to the 2005 SEC report, two special reports were released by the G4+1 group in 1996 and 1999 (a group that consisted of representatives from Australia, Canada, New Zealand, the United Kingdom, the United States, and the IASC). Essentially the two G4+1 special reports proposed that all leases be capitalised, as operating leases also give rise to assets and liabilities, and that the associated liabilities and assets should generally be recorded at the present value of the minimum payments required in terms of the lease. (Joint International Working Group on Leasing, 2007)

Research conducted by Imhoff et al. (1991, p. 51) indicated that capitalising operating leases enhances the relevance and comparability of measures of risk and return. Furthermore, research studies (e.g. Imhoff et al. (1993), Ely (1995), Beattie et al. (2000) and Bratten et al. (2013)) indicate that users capitalise operating leases when analysing financial statements as operating lease liabilities have a positive association with equity risk (i.e. the greater the extent of operating lease usage, as disclosed, the greater the entity"s equity risk). This may indicate that there is not a need to capitalise operating leases as these lease agreements are already taken into account by the market. However, based on a review of relevant literature, Schipper (2007, p. 324) concludes that “users do in fact process disclosed items differently from, and probably less thoroughly than, recognized items”. In support thereof, Grossman and Grossman (2010, p. 6) state that users of financial statements find that operating lease information disclosed in the notes of financial statements is inadequate in order to precisely and completely adjust by capitalising operating leases. Young (1999, p. 9) further emphasises the problem of adjusting accounting numbers when determining economic profit (EVA^{TM}), which includes an adjustment for capitalising operating leases, due to the limits imposed by the limited extent of financial statement disclosure. However, in contradiction to the other research findings noted above, Bryan et al. (2010, pp. 37-38) found

that for a selected company (Walgreens[9]) that they examined in detail, the majority of research analysts (10 out of 12) did not adjust for operating leases in their research reports, although rating agencies did incorporate the effects thereof. Bryan et al. further noted that the two research analysts who did adjust for operating leases had estimates that varied extensively – this would either be due to differing capitalisation methods or the inadequacy of financial statement disclosures relating to operating leases resulting in the need to make assumptions.

Section 2.3.1 provides greater detail on the current accounting treatment for leases while section 2.3.2 examines the proposed new changes to lease accounting.

2.3.1. Current Lease Accounting Rules

South African companies are required to report results in terms of International Financial Reporting Standards (IFRS) issued by the IASB. Under the existing IFRS for leases, IAS 17, leases are classified as either finance or operating leases; whereby a lease is classified as a finance lease if it "transfers substantially all the risks and rewards incidental to ownership of an asset", and an operating lease is any "lease other than a finance lease" (IASB, 2012, p. A638). The following eight examples of situations of when a lease will be classified as a finance lease are provided in paragraphs 10 and 11 of IAS 17: (a) the lease transfers ownership of the asset to the lessee by the end of the lease term; (b) the lessee has the option to purchase the asset at a price that is expected to be sufficiently lower than the fair value at the date the option becomes exercisable; (c) the lease term is for the major part *(note: this is explicitly stated as „at least 75%" under US GAAP in FAS 13)* of the economic life of the asset; (d) at the inception of the lease the present value of the minimum lease payments amounts to at least substantially all *(note: this is explicitly stated as „at least 90%" under US GAAP in FAS 13)* of the fair value of the leased asset; (e) the leased assets are of such a specialised nature that only the lessee can use them without major modifications; (f) if the lessee can cancel the lease, the lessor"s losses associated with the cancellation are borne by the lessee; (g) gains or losses from the fluctuation in the fair value of the residual accrue to the lessee; and (h) the lessee has the ability to continue the lease for a secondary period at a rental that is substantially lower than market-related rentals (IASB, 2012, p. A642). Essentially the focus of IAS 17 is on identifying if a lease is economically similar to a purchase transaction, in which case it is accounted for as a finance lease.

[9] Walgreens Company (Walgreens) was selected as a case study as it is a large US drug retailer that makes extensive use of operating leases – this was evident from the substantial future minimum lease payments disclosed in Walgreen"s annual financial statements.

Finance leases are then capitalised with a leased asset and lease liability reflected on the balance sheet of the lessee. In contrast operating leases are not capitalised with the periodic lease payment expensed by lessees (generally on a straight-line basis). This current accounting treatment for finance and operating leases has attracted criticism due to the fact that it does not entirely meet the needs of users of financial statements, most notably as follows in relation to lessees:

- Off-balance sheet financing is possible whereby entities enter into lease contracts that are classified as operating leases and not reflected on the statement of financial position – this provides a misleading picture about leverage (financial risk) and the assets that the lessee uses in its operations. Users often adjust for this and capitalise a lessee"s operating leases; however, there is frequently insufficient information for users to make reliable adjustments.
- Leasing transactions that are economically similar can potentially be accounted for differently as a result of the two different accounting methods (for operating and finance leases). This decreases the ability of users to compare financial statements and provides an incentive to structure transactions to achieve a particular accounting outcome. (IASB, 2013, p. 8)

Cornaggia et al. (2013, p. 347) note that entities deliberately structure leases as operating leases in order for the associated obligations to remain off-balance sheet. Furthermore, Knubley (2010, p. 323) notes that financial statement preparers have also found it difficult to apply the existing lease accounting rules as it is occasionally difficult to define the dividing line between operating and finance leases. Accordingly, subsequent to the proposals by the two G4+1 special reports to capitalise all leases, the IASB and the FASB initiated a joint project in 2006 to develop a new accounting approach for leasing activities that would address the issues raised above.

2.3.1.1. Accounting Provisions Previously Ignored

The literature reviewed in section 2.2 relating to operating lease capitalisation revealed that two accounting provisions have previously been ignored when constructively capitalising operating leases. Depending on the terms of the operating lease agreement and circumstances, these provisions could potentially result in liabilities that are already recognised for operating leases under the current accounting rules as follows:

- **Operating lease straight-lining provisions:** Paragraph 33 of IAS 17 requires lease payments under an operating lease to be recognised as an expense on a straight-line basis (IASB, 2012, p. A646). As a result thereof straight-lining provisions are

generally created when lease payments escalate annually in terms of the operating lease agreement.

- **Onerous operating lease contract provisions:** If an operating lease agreement is classified as an onerous contract in terms of IAS 37 then a provision (liability) must be recognised for the present obligation under the contract as required by paragraph 66 (IASB, 2012, p. A969). An onerous contract is defined in paragraph 10 of IAS 37 as "a contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it" (IASB, 2012, p. A961).

Both of the abovementioned provisions are effectively a liability that is recognised in respect of future minimum operating lease payments disclosed in the notes. Therefore, if these provisions are ignored when constructively capitalising operating leases, as has been the case with prior research, then a portion of the liability in respect of these future lease payments will be double counted and distort results. These provisions may not be material or materially distort analyses; however, this has not previously been considered and as such cannot be assumed to be immaterial. It is also suggested that the straight-lining provision may potentially be material especially in the case of retailers who enter into substantial long-term lease agreements for prime retail space which may include relatively high fixed escalation clauses in excess of inflation. Both of these provisions will be incorporated into the lease capitalisation model developed in Chapter 3 and the materiality thereof will also be evaluated in Chapter 4.

2.3.2. Proposed Lease Accounting Changes

Subsequent to the joint project initiated by the IASB and the FASB in 2006, the organisations released an exposure draft (ED/2010/9) during 2010 proposing a new accounting approach for lessees based on a right-of-use model. This proposed the capitalisation of all operating leases for lessees. Knubley (2010) and de Villiers and Middelberg (2013), amongst others, present an overview of this exposure draft; however, no further details thereof are noted in this report as it was subsequently withdrawn after feedback thereon was obtained. Although the feedback indicated general support for the proposed recognition of a lease liability and leased asset for all leases, contrary views on the following pertinent issues prompted the withdrawal of ED/2010/9: proposals not reflecting the economics of all leases (e.g. short-term leases); the proposal for two different lessor accounting models based on the type of lease; costs and complexities of the proposals, especially relating to variable lease

payments and optional renewal periods; and the breadth of the scope of the definition of a lease (IASB, 2013, pp. 9-10).

However, a revised exposure draft (ED/2013/6) was released in May 2013 by the IASB and the FASB. The core principle of this exposure draft (new proposed standard) is "that an entity shall recognise assets and liabilities arising from a lease" (IASB, 2013, p. 13). Pertinent aspects of this new exposure draft, which is also based on a right-of-use model, are highlighted below:

- Lessees will be required to recognise a right-of-use asset and a lease liability for all leases with a non-cancellable lease term of more than 12 months. This asset and liability will generally be recognised at a value equal to the present value of the lease payments discounted at the rate the lessor charges the lessee or the lessee's incremental borrowing rate.
- The right-of-use asset will be amortised over the lease term and interest recognised on the lease liability which reduces when lease payments are made.
- Leases will no longer be classified as either finance or operating leases (by the nature of the contract) but rather as Type A or Type B leases based on the consumption principle (by the nature of the asset) differentiating between an underlying leased asset that lessees consume during the lease term (generally assets other than property that depreciate over time such as vehicles, equipment and machinery – Type A[10]) and leased assets where the lessee merely pays for the use of the underlying asset (generally property which appreciates over time – Type B[11]).
- The above proposed classification is merely relevant for lessees with regards to how the income statement charge is calculated, disclosed and allocated between amortisation and interest. Regardless of classification all leases (Type A and Type B) will need to be capitalised by lessees in their financial statements. The proposed income statement impact for lessees with regard to Type A and Type B leases is as follows:
    - *Type A leases* – Recognise the unwinding of the discount on the lease liability as interest and recognise the amortisation of the right-of-use asset separately, generally on a straight-line basis.

[10] In terms of the proposals, property that is leased can nonetheless be classified as a Type A lease if the lease term is for the major part of the remaining economic life of the leased asset or if the present value of the lease payments equals substantially all of the fair value of the leased asset at lease inception. (IASB, 2013, p. 18)

[11] In terms of the proposals, an asset other than property that is leased can nonetheless be classified as a Type B lease if the lease term is for an insignificant part of the total economic life of the leased asset or if the present value of the lease payments is insignificant relative to the fair value of the leased asset at lease inception. (IASB, 2013, p. 18)

- *Type B leases* – recognise a single lease cost on a straight-line basis (calculated as the remaining cost of the lease allocated over the remaining lease term) – this lease cost will comprise the unwinding of the discount on the lease liability with the amortisation of the right-of-use asset. (IASB, 2013)

As noted by Jennings and Marques (2013, p. 55), present value amortisation (also known as economic or annuity amortisation) was the primary alternative amortisation method proposed by respondents providing feedback on the exposure draft (ED/2010/9) released during 2010. The present value amortisation method calculates amortisation on the leased asset as the "decline in value from one period to the next in the present value of the remaining expected future lease payments, and total lease expense is equal to the lease payment" (Jennings & Marques, 2013, p. 55). Using this method annual amortisation effectively increases over the lease term and equals the capital reduction in the lease liability. This amortisation method has now been incorporated into the new proposed accounting treatment in terms of the consumption principle for Type B (property) leases whereby the amortisation of the right-of-use asset will generally equal the capital reduction in the lease liability. For Type B leases this also results in the leased asset generally equalling the lease liability over the term of the lease which conforms to the present value amortisation approach; however, this does not conform to the ILW operating lease capitalisation method discussed in section 2.2.1. Despite this change, the new proposed accounting treatment for Type A (non-property) leases follows the ILW method whereby amortisation on the leased asset is generally calculated on a straight-line basis over the lease period. This differing accounting treatment between Type A and Type B leases in terms of the new proposed exposure draft is illustrated in Example 2.2 with respect to both the income statement and balance sheet impact thereof.

The new proposed accounting treatment in terms of exposure draft ED/2013/6 is important to note as an aspect of research conducted in this paper compares the results of this new proposed accounting treatment for leases to the results of the constructive capitalisation method developed in Chapter 3 and supported by the research of Imhoff et al. (1991 & 1997), Fulbier et al. (2008) and Jesswein (2009) discussed in section 2.2.1. When considering Example 2.2, this new accounting treatment will clearly have an impact on the income statement as a single straight-line lease cost is recognised for Type B leases as opposed to separate interest and amortisation charges (refer to Graph 2.2(a)). This not only impacts on total profitability but also on other measures of profitability e.g. operating margin as interest is normally reflected below the operating profit line; however, for Type B leases it will be included in the single lease cost as an operating expense and deducted in arriving at operating profit. The leased asset will also equal the lease liability for Type B leases whereas under the ILW method of constructive lease capitalisation, the leased asset is

always less than the lease liability during the lease term (refer to Example 2.1) as in the case of Type A leases. The research results of this study will therefore also provide a valuable indication of the likely impact that the new accounting rules will have on key financial ratios of South African companies if they come into effect.

It is to be noted that existing finance leases recognised in terms of IAS 17 are highly likely to be treated as Type A leases in terms of the new proposed lease accounting rules. This is a safe assumption due to finance leases generally relating the lease of assets with a shorter economic life (i.e. non-property assets such as equipment and vehicles) as opposed to property which has a longer economic life and is more likely to be accounted for as an operating lease in terms of IAS 17. This is an important consideration to note as there is essentially no major difference between the current accounting treatment for finance leases in terms of IAS 17 and the new proposed lease accounting treatment for Type A leases which both require a lease liability and leased asset to be recognised as well as the subsequent recognition of interest and depreciation (amortisation) charges.

***EXAMPLE 2.2*: Analysis of Type A and Type B Lease Accounting Treatment**

Same facts as Example 2.1 in section 2.2.1: The use of an asset is obtained for 5 years in terms of a lease agreement that requires annual lease payments of R100 000, in arrears. Assuming the appropriate before tax discount rate is 12%, the present value of the lease payments equals R360 477.62 at inception of the lease. If no other costs are incurred in connection with the lease then the leased asset also equals R360 477.62 at inception.

If the underlying leased asset is not property (e.g. machinery with a 5 year economic life) then the lease will be classified as a Type A lease and accounted for as follows:

The unwinding of the discount on the lease liability will be recognised as interest expense while an annual straight-line amortisation charge of R72 095.52 (360 477.62 ÷ 5) will be recognised over the 5 year lease term.

If the underlying leased asset is property (e.g. land with an indefinite economic life) then the lease will be classified as a Type B lease and accounted for as follows:

In this instance a single lease cost is recognised on a straight-line basis, comprising interest and amortisation. The unwinding of the discount on the lease liability will be recognised as the interest component of lease expense, while the annual amortisation component will be the difference between the straight-lined lease cost (R100 000) and the interest component. Therefore effectively the amortisation charge equals the capital reduction in the lease liability and the leased asset will consequently equal the lease liability over the term of the lease.

The accounting differences for the above Type A and type B leases are reflected in the following tables and graphs:

Table 2.2(a): Liability and asset balances – Type A versus Type B lease classification

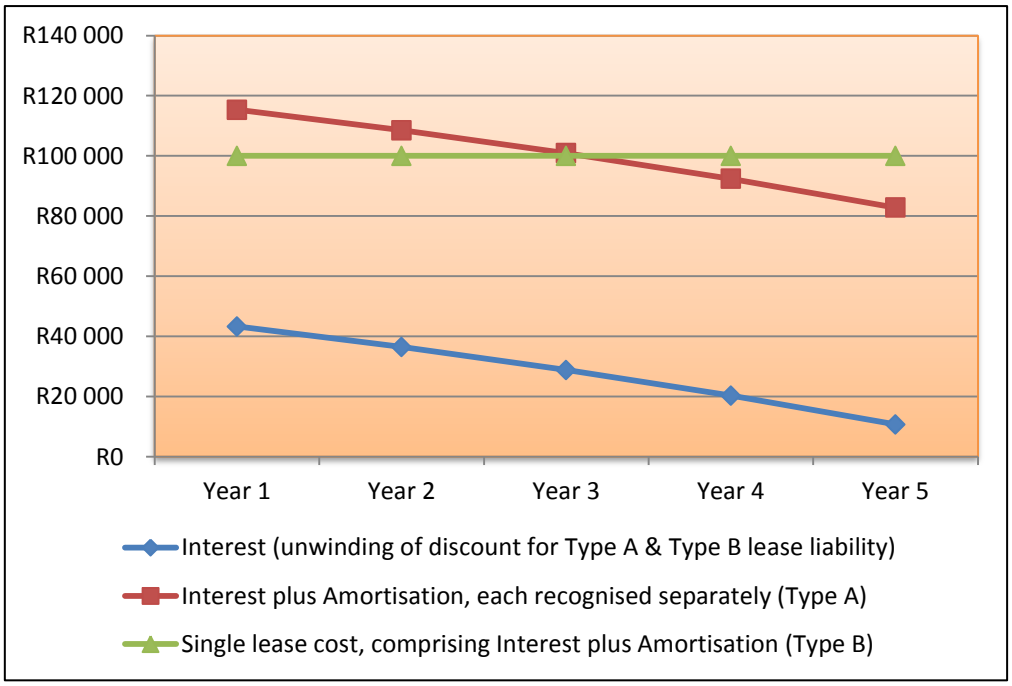
	Type A & Type B Lease liability balance (R)	*Type A* Leased asset balance (R)	*Type B* Leased asset balance (R)
Inception	360 477.62	360 477.62	360 477.62
Year 1	303 734.93	288 382.10	303 734.93
Year 2	240 183.13	216 286.57	240 183.13
Year 3	169 005.10	144 191.05	169 005.10
Year 4	89 285.71	72 095.52	89 285.71
Year 5	-	-	-

Table 2.2(b): Interest and amortisation amounts – Type A versus Type B lease classification

	Type A & Type B Interest expense (R)	*Type A* Amortisation (R)	*Type B* Amortisation* (R)
Year 1	43 257.31	72 095.52	56 742.69
Year 2	36 448.19	72 095.52	63 551.81
Year 3	28 821.98	72 095.52	71 178.02
Year 4	20 280.61	72 095.52	79 719.39
Year 5	10 714.29	72 095.52	89 285.71

* The amortisation charge (Type B) equals R100 000 minus the interest expense.

Graph 2.2(a): Expenses recognised over lease term – Type A versus Type B lease classification



2.4. Ancillary Leasing Issues

Barring the constructive capitalisation of operating leases and accounting treatment for leases covered in sections 2.2 and 2.3, there are many other avenues to lease research, some of which are covered in this section in light of the research focus of this paper.

Based on the premise that leasing is a source of finance similar to a loan then a relevant consideration is why entities would want to lease an asset rather than finance it another way. Before analysing the reasons why entities lease, the possibility that leasing can increase the value of an entity is briefly considered. This is considered in accordance with Modigliani and Miller"s seminal research and capital structure propositions, as summarised by Miller (1989), upon which many modern day finance theories are based. Modigliani and Miller proved under a strict set of assumptions, including no taxes, no transaction costs, no costs related to financial distress and no agency costs, that the value of an entity is entirely dependent on the operating cash flows arising from the assets that the entity has invested in, irrespective of how those operating assets are financed. Therefore the value of an entity is independent of the entity"s capital structure (gearing) in a world where there are, for example, no taxes and transaction costs. Based thereon, leasing, as source of finance, cannot increase an entity"s value. However, when relaxing the strict assumptions and considering a real world with taxes and other costs, Modigliani and Miller proved that as more debt was taken on the value of an entity increased due to the tax deductibility of interest but that only occurred up to a point where after too much debt (high gearing levels) meant a lower entity value in light of expected bankruptcy and agency costs. (Miller, 1989, pp. 7-8,11-13)

Therefore, considering a real world where there are benefits to leasing which can result in leasing being a more cost effective or more tax advantageous source of finance, essentially an entity can potentially lease an asset at a lower after-tax cost than conventional debt finance and the entity"s overall cost of capital can be lowered, consequentially increasing value. On the other hand, further benefits of leasing may not reduce the cost of capital but may reduce operating costs or increase revenue leading to an increase in the value of the entity. The value of an entity can therefore be increased through an entity leasing its operating assets due to the benefits of leasing noted below, as opposed to obtaining the use of the assets by way of another source of finance.

Correia et al. (2011, pp. 15.10-15.12) provide an extensive list of the reasons why entities choose to lease an asset rather than buying it – these benefits to the lessee include operating flexibility, avoiding obsolescence risk, no need for a deposit, standardised contracts, avoidance of capital expenditure controls and, in the case of operating leases,

obtaining off-balance sheet financing. Furthermore they note that lessees can benefit from lower lease rentals due to tax advantages and the economies of scale of the lessor. On the other hand Correia et al. (2011, p. 15.10) note that leasing may be the only option for an entity to obtain the use of an asset if the manufacturer thereof does not sell the assets but only leases them.

A survey by Drury and Braund (1990, pp. 189-190) found that, despite all the theoretical reasons for leasing, respondents leased assets based on two main reasons, namely tax considerations and that the relative cost of leasing was less than other sources of finance, while other qualitative and cash flow factors were found to be less important. Empirical results from research by Sharpe and Nguyen (1995, pp. 291-293) confirm that leasing is largely influenced by the associated financial contracting costs and tax-related motivations. A more recent survey of equipment users around the world that focused predominantly on qualitative factors, indicated that the two main reasons for leasing was to meet peak demands and obtain products that are only used periodically, essentially operating flexibility, while the third most popular reason was to reduce overall operating costs (Pollok, 2012, p. 28). This survey omitted the benefit of off-balance sheet financing and the financial considerations relating to the tax advantages and the relative cost of leasing, but it nonetheless emphasizes that other qualitative factors are considered by entities that decide to lease.

Despite the abovementioned reasons for leasing, a number of research studies have aimed to identify what characteristics of an entity, such as leverage, tax position, growth, ownership structure and size, determine the entity"s propensity to use operating and/or finance leases (e.g. Callimaci et al. (2011), Koh and Jang (2009), Adams and Hardwick (1998), Lasfer and Levis (1998) and Sharpe and Nguyen (1995)). Although it has been found that the propensity to lease is related to a number of characteristics, the focus of section 2.4.1 is on research findings in relation to the size of an entity and its propensity to lease in line with one of the secondary research objectives of this study.

2.4.1. Entity Size and Propensity to Lease

Research focusing on the size[12] of an entity and the entity"s propensity to lease has yielded mixed results. Research by Sharpe and Nguyen (1995, p. 283) found that smaller US

[12] Turnover or number of employees was used as a proxy for entity size in prior research (see for example Sharpe & Nguyen (1995, p. 280) and Adams & Hardwick (1998, p. 491)) rather than total assets due to the fact that entities that lease more will have fewer recognised assets in terms of the current accounting treatment for operating leases and that assets are part of the dependent variable (extent of lease usage) which could lead to simultaneous equation bias.

entities had a greater propensity to lease in respect of both finance and operating leases than their larger counterparts. They indicated that this could be due to two reasons: 1) greater information asymmetry for small entities between the entity and the providers of conventional loan finance, leading to increased transaction costs; and 2) greater uncertainty for smaller entities regarding asset needs and their inability to fully utilise assets (Sharpe & Nguyen, 1995, p. 280). Although Lasfer and Levis (1998, p. 170) only considered finance leases for a sample of UK companies, based on their results and in line with Sharpe and Nguyen, they suggested that small entities are more in need of leasing than larger entities.

However, a curvilinear relationship between size and leasing (finance and operating) intensity was identified by Adams and Hardwick (1998, p. 493) on a smaller sample of UK companies – their research results indicated that leasing decreased with company size up to a certain level of turnover where after, for larger companies, it tended to increase. Adams and Hardwick (1998, p. 493) suggest their results for smaller companies could be due to their inability to fully utilise assets and their uncertainty regarding asset needs, while the increase in lease usage by larger companies is likely due to the attraction to enter into operating leases for certain assets (e.g. cars and computer equipment) and possible savings in procurement and transaction costs relating to specific low value assets. When considering the US hotel industry and operating lease usage, Koh and Jang (2009, p. 640) found a similar curvilinear relationship as identified by Adams and Hardwick.

A recent study on Canadian listed companies by Callimaci et al. (2011, p. 277) found that the propensity to lease decreased as the size of the entity increased – when considering operating leases the same conclusion was reached; however, the propensity to enter into finance leases increased with entity size i.e. larger entities were less likely to enter into operating leases but more likely to enter into finance leases. More recently, Cornaggia et al. (2013, p. 350) also proved that entity size is inversely related to operating lease usage when analysing entity data in the US from 1980 until 2007.

As no prior research findings were found regarding leasing propensity in South Africa, this research paper aims to identify the bearing that the size of South African companies has on their propensity to lease.

2.5. Conclusion

This chapter predominantly focused on literature relating to the capitalisation as well as the accounting treatment of leases. It is clear that a lease agreement creates an obligation which should be capitalised; hence the move by accounting standard setters towards capitalising all leases in the financial statements of lessees in terms of the new accounting treatment proposed by ED/2013/6.

Nonetheless, in terms of the current accounting treatment, operating leases are not recognised on the face of the balance sheet but rather disclosed in the notes. The ILW lease capitalisation method developed by Imhoff et al. (1991 & 1997) was therefore developed to constructively capitalise the disclosed future minimum lease payments relating to operating leases. This method has proven to be accurate, although a subtle adjustment using a geometric degression model by Fulbier et al. (2008) was required in respect of certain aggregated minimum lease payments disclosed in terms of IAS 17. Incorporating company-specific adjustments also improved the accuracy of the ILW model. This adapted ILW method will be used as a starting point when developing a capitalisation model in Chapter 3.

Constructively capitalising operating leases has been found to substantially change key financial statement figures and ratios, most notably leverage ratios, the current ratio, times interest earned and profitability ratios. Altman's Z-score, an indication of creditworthiness, also decreased considerably when operating leases were capitalised. The impact of operating lease capitalisation was also found to be greater in the following industries: retailers, restaurants, hotels, transportation and industrial products – indicating extensive use of operating leases in these industries. These findings will inform the selection of companies and analyses performed in this research paper.

Thereafter the accounting treatment for leases, current and proposed, was reviewed. Research findings have indicated that the use of operating leases has grown and far exceeds finance lease usage since the adoption of the current accounting treatment for leases. This research study therefore aims to provide an indication of the extent of operating lease usage in South Africa as compared to finance leases. In addition, the current accounting provisions recognised for operating leases in respect of onerous contracts and straight-lining of lease payments, not previously considered, will now be considered when refining the ILW method in the next chapter. Furthermore, the new proposed accounting treatment for Type A and Type B leases will also be incorporated into the operating lease capitalisation model for analysis and comparison to the results of the adapted ILW constructive capitalisation method.

Finally, research in other countries has indicated that generally an entity"s propensity to lease is inversely related to its size; however, certain studies have proven that although leasing decreases with size initially this only occurs up to a point where after leasing increases with entity size. Differences have also been noted with regards to the use of operating leases (decreases) and finance leases (increases) with respect to entity size.

Chapter 3 outlines the methodology followed in this study, most notably the model developed and sample selected, which will largely be based on the prior literature reviewed in this chapter and conclusions drawn therefrom.

Chapter 3: Methodology

3.1. Introduction

The objective of this study is to undertake quantitative research with an experimental design; largely focusing on the impact that capitalising operating leases has on the reported numbers and key financial ratios of South African companies. In order to address the first research question outlined in section 1.2, a constructive operating lease capitalisation model was developed in line with the objectives supporting that question. The model developed is described in section 3.3 and is largely based on the literature reviewed in Chapter 2, particularly in line with the methodology employed by Imhoff et al. (1991 & 1997).

Section 3.2 sets out the South African listed companies selected for inclusion in this study and the reasons for such inclusion, while section 3.4 provides insight into how the company data captured in the model will be analysed.

3.2. Data Selection

The population of companies covered by this research study comprises all of the companies listed on the Main Board of the JSE that operate within the following sectors: General Industrials; Industrial Transportation; Food & Drug Retailers; General Retailers and Travel & Leisure. These five specific sectors were selected for two reasons, namely:

i. Based on prior research noted in section 2.2.2.3 (e.g. Imhoff et al. (1991), Beattie et al. (1998), Grossman and Grossman (2010) and Jennings and Marques (2013)), companies in these five sectors of the JSE are likely to make the most extensive use of operating leases.
ii. This population includes companies that will have substantial Type A (non-property) leases, e.g. transportation companies, as well as companies with substantial Type B (property) leases, e.g. retailers. This will enable meaningful analysis of the impact of the new proposed accounting treatment for leases.

All companies listed on the JSE Main Board in these sectors were initially selected for testing and based thereon the population comprised 53 JSE-listed companies, as at 9 September 2013, as summarised in Table 3A. The required data was then collected from the annual financial statements of all the selected companies in respect of the most recent financial year ended on or before 30 June 2013.

Table 3A: Selected companies – by sector

Sector	JSE Listed Companies
Food & Drug Retailers	5
General Industrials	11
General Retailers	18
Industrial Transportation	7
Travel & Leisure	12
Five sectors (total)	53

With respect to the operating lease capitalisation model developed in section 3.3, a company would be excluded from the final sample if the operating lease disclosure did not include either of the following:

- Non-cancellable future minimum lease payments split between property and non-property; or
- Operating lease rental expense split between property and non-property (to be used as a proxy for splitting future minimum lease payments).

This information improves the accuracy of the operating lease capitalisation model developed and it is also required in order to determine the impact of the new proposed accounting treatment for Type A (non-property) leases and Type B (property) leases. Although the above disclosure is voluntary, as it is not required in terms of the current accounting standard (IAS 17) dealing with leases, the majority of companies disclose this information in the notes to their financial statements as it is considered useful for users thereof.

3.3. Model Development

The operating lease capitalisation model developed in this research study is predominantly based on the ILW method of constructively capitalising operating leases developed by Imhoff et al. in their seminal research papers (1991 & 1997) – refer section 2.2.1. The ILW method discounts disclosed future minimum operating lease payments (hereon referred to as MLP) at the entity"s incremental pre-tax borrowing rate and has been used extensively in prior research studies (see for example Beattie et al. (1998), Durocher (2008), Fulbier et al.

(2008), de Villiers and Middelberg (2013) and others noted in section 2.2.1), some of which has proved the ILW method"s reliability (see Bratten et al. (2013)). This method further determines the unrecorded leased asset using an asset ratio which has also been incorporated into the developed model.

The model used in this study was developed in Microsoft Excel and tested following these seven steps:

Step 1: Identifying required financial information

The first step in developing the model was identifying the financial information that needed to be captured for each company in order to calculate the unrecorded operating lease liability and associated asset. Furthermore all the financial information relating to figures and ratios that would be impacted by operating lease capitalisation or required to answer the other research questions set out in section 1.2, had to be identified and incorporated into the model.

Based on this step it was determined that the individual annual financial statements of each company would be reviewed in order to collect all the necessary information, as it was not possible to obtain the required information from third party financial data providers such as McGregor BFA, Datastream or Bloomberg[13].

Step 2: Determining the unrecorded lease liability

In accordance with the ILW method, the operating lease liability was determined as the present value of the MLPs (minimum lease payments) discounted at the company"s incremental pre-tax borrowing rate. Furthermore, in line with Imhoff et al. (1997) the applicable incremental borrowing rate for each company was determined based on the following two proxies:

i. The interest rate implicit in the company"s finance leases which may be disclosed or determined from required finance lease disclosures.
ii. The interest rate implicit in the company"s recognised debt which may be disclosed or determined as gross interest expense divided by the book value of all interest bearing debt.

As noted by Imhoff et al. (1997), a greater degree of ownership risk remains with lessors in respect of operating leases, therefore a slightly higher interest rate is likely more applicable for operating leases compared to finance leases and other recognised debt (although this

[13] Two leading providers of financial data, Bloomberg and McGregor BFA, were contacted and it was confirmed that they did not have all the financial and non-financial data required for this research study.

may be mitigated by the nature of the assets and the benefits of retaining security over the assets that lessors possess in terms of such lease contracts). Nonetheless, when they provide reasonable results, these are considered the best proxies for an appropriate discount rate in light of the fact that the weighted average interest rate implicit in a company's portfolio of operating leases (as charged by the lessor) is not disclosed. However, this is considered in the model as the higher of the above two interest rate proxies will be used.

If an interest rate cannot be determined (i.e. if a company does not have any finance leases or recognised debt) or the results are unreasonably high or low[14] then the current South African prime lending rate of 8.5% (South African Reserve Bank, 2013) will be used in line with de Villiers and Middelberg (2013, p. 661). The prime lending rate is used as it is the "benchmark rate at which private banks lend out to the public" (South African Reserve Bank, 2013). Although the discount rate is noted as a limitation due to the difficulty in establishing an appropriate company-specific rate, using a company-specific discount rate where possible is considered superior to using a blanket rate, such as the prime lending rate, for all companies. The use of company-specific discount rates differentiates between the varying risk profiles of the companies selected and is in accordance with Durocher (2008) and Fulbier et al. (2008). Furthermore, the interest rate charged by lenders of other recognised forms of debt would be based on the overall risk of the company, including consideration of off-balance sheet operating leases (Lightner, et al., 2013, p. 19).

A unique aspect of the model developed is the fact that a separate operating lease liability and associated asset was determined for property (Type B) and non-property (Type A) leases based on the MLPs in respect of each of these lease types. This was done for two reasons, namely:

i. To improve the accuracy of the operating lease capitalisation model as property leases generally have a longer lease term than non-property leases and the length of the lease term impacts on the determination of the unrecorded liability, leased asset and consequential adjustments.
ii. To determine the impact of the new proposed accounting treatment which differs for Type A (non-property) leases and Type B (property) leases.

Although IAS 17 currently does not require the split of MLPs between property and non-property, many companies disclose this split voluntarily as it provides users with useful

[14] An unreasonably high interest rate (e.g. 25%) or low interest rate (e.g. 3%) can result when using the two proxies suggested by Imhoff et al. (1997) due to the year end balances for finance lease liabilities and recognised debt being used in the proxy calculations as well as the aggregated and summarised nature of financial statement disclosures.

information. If this information was not disclosed then a further voluntary, yet common, disclosure was used to estimate the split of the aggregated MLPs between property and non-property. The disclosure used as proxy in this regard is the operating lease rental expense relating to property and non-property[15]. The aggregate MLPs disclosed (Total MLP) in respect of each period is then split between property and non-property as follows:

$$MLPs\ (property) = Total\ MLP\ \times \left(\frac{Operating\ lease\ expense\ (property)}{Total\ operating\ lease\ expense}\right)$$

$$MLPs\ (non\text{-}property) = Total\ MLP\ \times \left(\frac{Operating\ lease\ expense\ (non\text{-}property)}{Total\ operating\ lease\ expense}\right)$$

$$Where,\quad Total\ operating\ lease\ expense = Operating\ lease\ expense\ (property) + Operating\ lease\ expense\ (non\text{-}property)$$

Thereafter, based on the required disclosures of IAS 17, the geometric degression model used by Fulbier et al. (2008) was incorporated into the model to convert the total amount disclosed in terms of IAS 17, for MLPs due later than one year and not later than five years after reporting date, into annual lease payments that decline at a constant rate over the four year period. Therefore, using Microsoft Excel's Goal Seek function, the model calculates a constant degression factor (*dg*) which ensures that the MLP of the next period equals the prior period MLP multiplied by *dg*. Furthermore a check ensures that the sum of all of the MLPs calculated using this degression model for the four year period equals the total amount disclosed for the same period.

The average remaining lease life after five years from reporting date is estimated by the model as the aggregated MLPs due after five years divided by the MLP disclosed in respect of the fifth year with the result rounded up and another year added. This is accordance with the ILW method and due to the fact that MLPs generally decline as lease agreements come to an end – this assumption is logical and sensitivity results by Imhoff et al. (1997, p. 17) demonstrated that changes in this assumption did not materially affect the estimation of the unrecorded liability. Based thereon, the MLP due in respect of each year after five years from reporting date (noted hereon after as MLP_{5+ILW}) equals the aggregated MLPs due after five years divided by the estimated average remaining lease life. Furthermore, it follows that

[15] Although many entities provide voluntary information regarding the operating lease rental expense split between property and non-property for the benefit of the users of their financial statements, often this information is provided in order to comply with IAS 1 paragraph 97 which requires separate disclosure of the nature and amount of material income and expense items such as leasing charges (IASB, 2012, p. A481).

the total average remaining lease life is five years plus the average remaining life after five years calculated in terms of this paragraph.

Based on the above inputs, namely the discount rate and the scheduled annual MLPs, the operating lease liability is calculated. However, a further unique aspect incorporated into this model is the deduction from the calculated operating lease liability of any straight-lining and onerous contract provisions that have already been recognised in respect of operating leases (refer section 2.3.1.1) in order to determine the unrecorded portion thereof. If these provisions are not adjusted then the operating lease liability will be overstated as a portion thereof will be double counted.

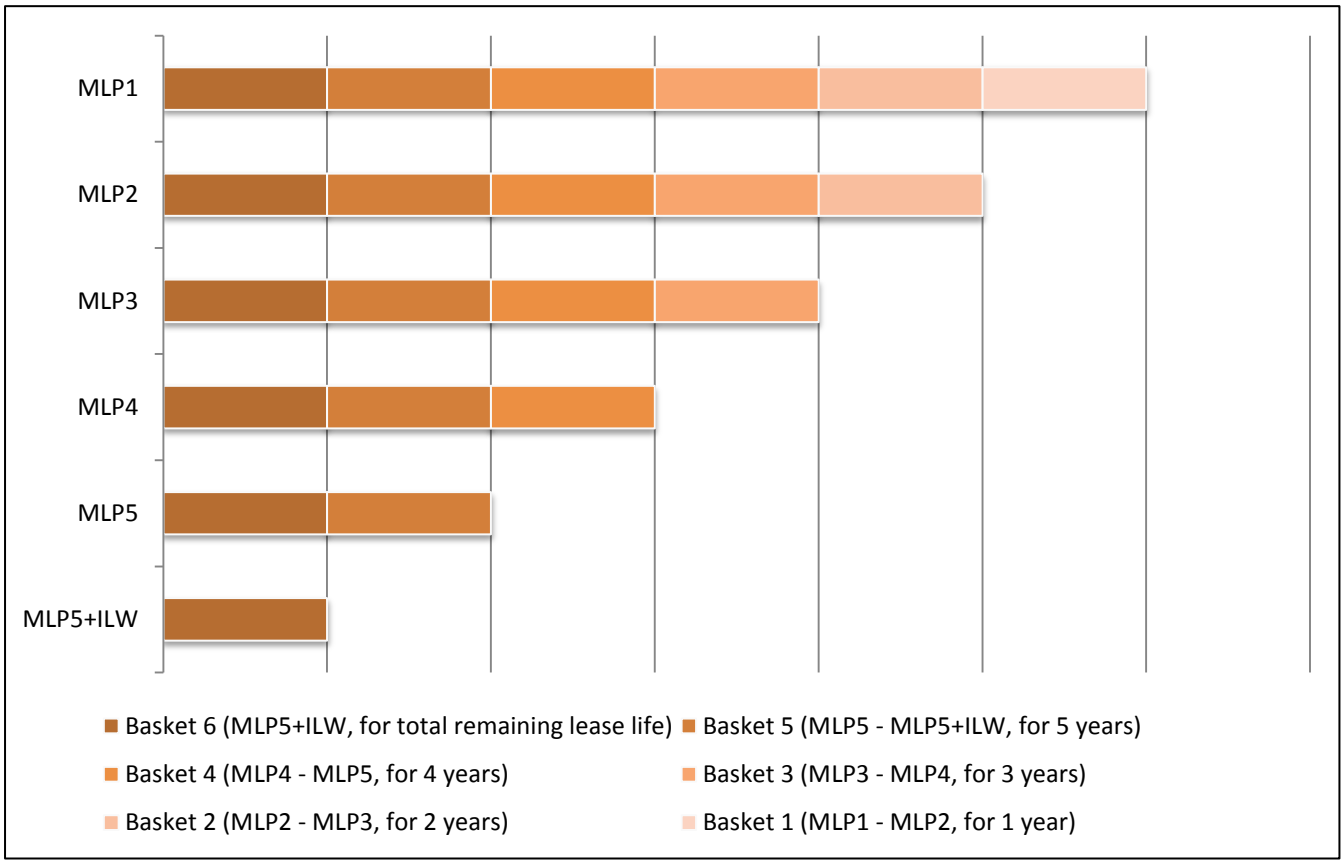
Furthermore, the current and non-current portions of the unrecorded operating lease liability are determined for more accurate analyses of the impact of constructive operating lease capitalisation. The current portion is calculated as the present value of the MLP due within one year after the reporting date adjusted by any current portion of the straight-lining and onerous contract provisions, if applicable. The non-current portion is the difference between the unrecorded operating lease liability and the calculated current portion.

Finally, it is to be noted that the liability determined in accordance with this step will be the same as the liability that is to be recognised in terms of the new proposed lease accounting rules for both Type A and Type B leases. No further adjustment is therefore necessary in that respect.

Step 3: Determining the unrecorded leased asset

The unrecorded leased asset was also determined in accordance with the ILW method using the asset ratio noted in section 2.2.1 when ignoring the new proposed accounting treatment. However, the ILW method is adapted to incorporate Fulbier et al."s (2008) contract basket approach outlined in section 2.2.1 (refer also Graph 2A). This approach determines baskets of MLPs with a basket being the difference between the MLPs in respect of two consecutive years which is assumed to be the lease contracts ending in the first of those two consecutive years. Fulbier et al."s model comprised five baskets; however, this model will incorporate the addition of a sixth basket in order to conceptually improve the accuracy of the leased asset value and the incorporation of this basket approach into the ILW method. The fifth basket of Fulbier et al. comprised MLP_5 and was assumed to have a remaining life of five plus (MLP_{5+}/MLP_5) years; however, in this study the fifth basket will comprise MLP_5 minus MLP_{5+ILW} which has a remaining life of five years while the additional sixth basket will comprise MLP_{5+ILW} with a remaining life equal to the total average remaining lease life calculated in terms of Step 2 when determining the lease liability. Graph 3A illustrates this adapted approach to determining the six lease contract baskets.

Graph 3A: Illustration of adapted lease contract baskets



The ILW method is subsequently applied to each contract basket in order to determine the lease liability applicable to that basket. The asset ratio formula is then applied to the unrecorded liability calculated for each of the six contract baskets in order to determine each basket"s leased asset. In calculating the asset ratio, 50% of the leased assets useful life (lease term) is assumed to have expired on average – a reasonable assumption based on the fact that entering into lease agreements will be a normal part of most business entities operations and occur on an annual basis. This percentage was suggested by Imhoff et al. (1991) and has been used in many subsequent research studies when constructively capitalising operating leases (e.g. Bennett and Bradbury (2003), Duke and Hsieh (2006), Fulbier et al. (2008), Branswijck and Longueville (2011) and Tai (2013)). Furthermore, the leased assets in respect of the six contract baskets are summed in order to determine the aggregate leased asset in respect of operating leases.

However, when considering the new proposed accounting treatment for leases, the leased asset that is to be recognised for Type B (property) operating leases is not determined using the asset ratio of the ILW method as the leased asset generally equals the lease liability – as noted in section 2.3.2 and Example 2.2 (i.e. a constant asset ratio of 100% is appropriate). Therefore the model used in this study was adapted to incorporate a “Type B lease indicator”

which, when turned “ON”, applies an asset ratio equal to 100% to the property (Type B) operating lease liabilities. Otherwise the leased asset is determined in accordance with the aforementioned paragraph for Type A (non-property) leases using the asset ratio formula.

Despite using the ILW method asset ratio formula in the model, the result of the asset ratio formula was subsequently adjusted, where necessary, in order to take cognisance of any straight-lining and onerous contracts provisions that may already be recognised in respect of operating leases. These provisions were dealt with as follows:

Straight-lining provisions:

As indicated in Step 2, straight-lining provisions impact on the determination of the unrecorded liability; however, they also impact the calculation of the unrecorded asset as indicated in Example 3.1. Due to the recognition of a straight-lining lease provision, Table 3.1(b) indicates that the ILW method formula used to determine the unrecorded leased is no longer accurate as the percentages calculated in columns four and five are not equal. This difference is due to the lease liability decreasing at a slower rate when lease payments escalate (with more of the capital portion repaid at a later date) as opposed to a lease liability that is repaid in equal payments (a constant annuity and one of the assumptions built into the asset ratio formula of Imhoff et al. (1991)). If the lease payments did not increase and were constant then the percentages in columns four and five of Table 3.1(b) would be equal as proven in Example 2.1. However, with increasing lease payments, the actual asset value is now less than the asset value calculated using the asset ratio formula of the ILW method. Table 3.1(d) calculates the value of the difference between these two asset values in the fourth column and, as can be seen, this difference is close, although not equal, to the recognised straight-lining provision. Therefore, although the ILW method's asset ratio does not correctly calculate the leased asset value in this context, the straight-lining provision can be subtracted from the result of the asset ratio formula in order to more accurately calculate and not overstate the leased asset balance. This is indicated in Graph 3.1(a) – the unadjusted leased asset value calculated using the asset ratio formula clearly overstates the asset value but when the straight-lining provisions is deducted it is more in line with the actual asset value. This adapted approach, of deducting the straight-lining provision from the leased asset value calculated using the asset ratio, was incorporated into the model and will result in the best estimate of the leased asset in light of the fact that an improved formula cannot be developed (as specific information relating to individual lease agreements and further details of the straight-lining provision are not disclosed).

When considering the new proposed accounting treatment, Type A leases are to be accounted for in line with the ILW method of constructive capitalisation therefore the

aforementioned adjustments will still be applicable for straight-lining provisions. However, as mentioned, the model was adjusted to incorporate differences relating to the proposed accounting treatment for Type B leases, most notably that normally the leased asset equals the lease liability under the proposed Type B lease accounting treatment. When considering Type B leases with escalating payments the leased asset is less than the lease liability by an amount equal to the straight-lining provision as indicated in Table 3.1(f) of Example 3. Therefore, in respect of Type B leases and in line with the adjustment required for the ILW method, the asset adjustment in terms of this model equals the lease liability calculated in Step 2, prior to adjusting for any provisions, less any straight-lining provisions already recognised.

Onerous contract provisions:

As indicated in Step 2 onerous contract provisions in respect of operating leases impact on the determination of the unrecorded liability. However, although an onerous contract provision is a likely indication that the leased asset is impaired if the future economic benefits expected to flow to the entity from the lease are less that the calculated asset value, such an impairment cannot be determined with any certainty as information in this regard is not required to be disclosed for onerous contracts. Therefore an adjustment is merely made to the lease liability in respect of onerous contract provisions, as noted in Step 2, and the impact thereof on leased assets is ignored and assumed to be immaterial for both the ILW method and Type B leases in the model.

***EXAMPLE 3.1*: Analysis of Straight-lining Lease Provisions and the Leased Asset**

Similar facts as Example 2.1 in section 2.2.1: The use of an asset is obtained for 5 years in terms of a non-cancellable operating lease agreement that requires an initial annual lease payment of R100 000, in arrears, which increases by 10% in subsequent years. Assuming the appropriate before tax discount rate is 12%, the present value of the lease payments equals R430 766.87 at inception of the lease [the amortisation table is presented in Table 3.1(a)]. If no other costs are incurred in connection with the lease then the leased asset also equals R430 766.87 at inception resulting in an annual straight-line amortisation charge of R86 153.37 (430 766.87 ÷ 5). Based thereon the lease liability and asset balances will be as presented in Table 3.1(b) at each year end.

Based on the total of the escalating lease payments due over the lease term of R610 510.00, the annual straight-lined operating lease expense to be recognised under the current accounting treatment in IAS 17 equals R122 102.00 (610 510.00 ÷ 5). Table 3.1(c) presents the straight-lining lease provision that will result as a consequnce of recognising the straight-lined lease expense, while the remaining tables and graph in the example are presented in support of the model developed to incorporate straight-lining provisions and the new proposed accounting treatment for Type B leases.

Table 3.1(a): Lease liability amortisation table

	Payment (R)	Interest (R)	Capital (R)	Balance (R)
Inception				430 766.87
Year 1	100 000.00	51 692.02	48 307.98	382 458.90
Year 2	110 000.00	45 895.07	64 104.93	318 353.97
Year 3	121 000.00	38 202.48	82 797.52	235 556.44
Year 4	133 100.00	28 266.77	104 833.23	130 723.21
Year 5	146 410.00	15 686.79	130 723.21	-
Total	610 510.00	179 743.13	430 766.87	

Table 3.1(b): Liability and asset balances under the lease

	Lease liability balance (R)	Leased asset balance (R)	Ratio of leased asset to lease liability	ILW method asset ratio formula result*
Inception	430 766.87	430 766.87	100.0%	100.0%
Year 1	382 458.90	344 613.50	90.1%	94.9%
Year 2	318 353.97	258 460.12	81.2%	90.1%
Year 3	235 556.44	172 306.75	73.1%	85.3%
Year 4	130 723.21	86 153.37	65.9%	80.7%
Year 5	-	-	-	-

* The ILW method asset ratio is calculated using the following formula developed by Imhoff et al. (1991) and discussed in section 2.2.1:

$$Asset\ ratio = (RL \div TL) \times \{(PVA_{TL,i}) \div (PVA_{RL,i})\}$$

Table 3.1(c): Lease payment, straight-lined lease expense and resulting straight-lining provision

	Lease payment (R)	Lease expense (straight-lined) (R)	Straight-lining provision balance (R)
Year 1	100 000.00	122 102.00	22 102.00
Year 2	110 000.00	122 102.00	34 204.00
Year 3	121 000.00	122 102.00	35 306.00
Year 4	133 100.00	122 102.00	24 308.00
Year 5	146 410.00	122 102.00	-
Total	610 510.00	610 510.00	

Table 3.1(d): Differences between asset values considering the asset ratio formula

	Actual leased asset balance (R)	Leased asset balance using asset ratio formula* (R)	Difference between actual and formula asset balances (R)	Straight-lining provision balance recognised (R)
Inception	430 766.87	430 766.87	-	-
Year 1	344 613.50	363 126.81	18 513.31	22 102.00
Year 2	258 460.12	286 679.95	28 219.83	34 204.00
Year 3	172 306.75	200 971.03	28 664.28	35 306.00
Year 4	86 153.37	105 555.06	19 401.69	24 308.00
Year 5	-	-	-	-

* This balance is obtained by multiplying the lease liability balance (column two in Table 3.1(b)) by the asset ratio calculated in the final column of Table 3.1(b). Differences noted are due to rounding.

Graph 3.1(a): Leased asset balance comparisons

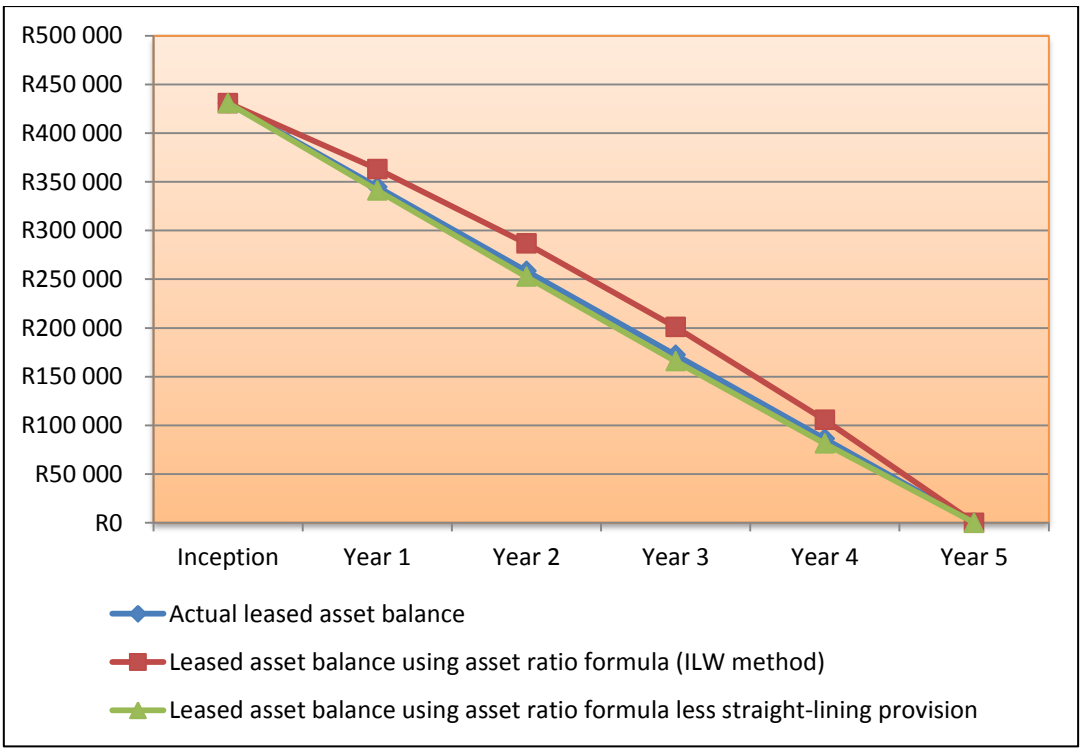


Table 3.1(e): Type B lease – amortisation calculation

	Lease expense (straight-lined) (R)	Interest expense (R)	Amortisation* (R)
Year 1	122 102.00	51 692.02	70 409.98
Year 2	122 102.00	45 895.07	76 206.93
Year 3	122 102.00	38 202.48	83 899.52
Year 4	122 102.00	28 266.77	93 835.23
Year 5	122 102.00	15 686.79	106 415.21
Total	610 510.00	179 743.13	430 766.87

* With Type B leases the amortisation equals the difference between the straight-lined lease expense and the interest recognised on the lease liability, as reflected above.

Table 3.1(f): Type B lease – lease liability and leased asset balance differences compared to the straight-lining provision

	Lease liability balance (R)	Leased asset balance (R)	Difference between lease liability and leased asset balances (R)	Straight-lining provision balance recognised (R)
Inception	430 766.87	430 766.87	-	-
Year 1	382 458.90	360 356.89	22 102.01	22 102.00
Year 2	318 353.97	284 149.96	34 204.01	34 204.00
Year 3	235 556.44	200 250.44	35 306.00	35 306.00
Year 4	130 723.21	106 415.21	24 308.00	24 308.00
Year 5	-	-	-	-

Step 4: Determining the impact on equity, deferred tax and current year profit

The difference between the unrecorded lease liability and leased asset arising from capitalising MLPs results in an adjustment (debit) to equity (retained earnings) and deferred tax. This is due to the historic differences between the operating lease expense recognised and the charges (interest and amortisation) that would have been recorded if the operating lease had been capitalised and the lease liability exceeding the leased asset. The resulting debit to deferred tax is proportionately allocated between the recognised deferred tax asset and liability balances of each company, as detailed in note 2 of Table 3B.

A tax rate of 28% is utilised (the current South African corporate tax rate levied by the South African Revenue Services) for the adjustment to deferred tax and all other tax adjustments in the model. The effective tax rate of each company is not utilised due to the distortion of items such as non-deductible expenditure or non-taxable income (permanent differences between accounting profit and taxable income), unrecognised assessed tax losses and secondary tax on companies which was replaced by a new dividend withholding tax on 1 April 2012. The effective tax rate is essentially the result of a number of adjustments or differences between taxable income and accounting income; however, individual items should be evaluated at the marginal tax rate. Fulbier et al. (2008, p. 127) also note the high aggregation level of consolidated data as another drawback of using a company specific average effective tax rate. Furthermore, the South African corporate tax rate of 28% is considered appropriate as the companies selected are listed on the JSE and, despite some having overseas operations, are likely to pay tax on most of their profits in South Africa. Furthermore, although leasing may occur in a different country with a different marginal tax rate to that of South Africa, when evaluating consolidated numbers this difference is not possible to model accurately without more detailed information about location of leased assets. Therefore the use of a marginal tax rate of 28% is a reasonable estimate of the marginal tax rate facing the selected companies with respect to leasing decisions.

In order to determine the income statement impact of capitalising operating leases on the most recently ended financial year, a series of balance adjustments are utilised as outlined by Imhoff et al. (1997, p. 21). This is done in order to improve the accuracy of the relevant profit adjustments calculated, especially the amortisation amount relating to the unrecorded operating lease asset which is challenging to determine without detailed information relating to the leases. Therefore the same process as outlined in Step 2 and Step 3 is also followed for the prior year (using comparative figures in the financial statements reviewed) and the resulting equity adjustment calculated. The difference between the equity adjustment for the most recently ended financial year (REFY) and that of the prior year (PY) is then the

aggregate after-tax impact on profit resulting from capitalising off-balance sheet operating leases in the REFY. This value is then grossed up to before tax and the amortisation charge relating to the operating leased asset capitalised is calculated as follows:

Impact on profit (before tax) for REFY (note i)	*xxx*
Plus: Operating lease expense recognised in REFY reversed (note ii)	*xxx*
Less: Interest expense on operating lease liability for REFY recognised (note iii)	*(xxx)*
Amortisation on leased asset in REFY recognised (balancing figure)	*xxx*

Notes:

i. *Impact on profit for any given year could be positive or negative depending on the phase of the lease and in this instance is defined as the equity adjustment for the REFY less the equity adjustment for the PY – an after-tax number which is then grossed up to before tax.*

ii. *The actual operating lease expense recognised for the REFY is not reversed as it could include contingent and cancellable operating lease payments made that were not disclosed as MLPs according to IAS 17 paragraph 35* (IASB, 2012, p. A646)*. The operating lease expense relating to non-cancellable MLPs discounted and included in the operating lease liability is therefore determined as the MLPs disclosed in the PY that are due in respect of the first year after reporting date which is adjusted by a leasing expense increase factor to take into account any new leases entered into during the REFY (note: if this calculated figure is greater than the actual operating lease expense recognised for the REFY, then the latter is reversed and the calculated figure ignored as the reversal in any given year cannot be greater than the actual operating lease expense recognised in that year). This leasing expense increase factor is only applied if it is greater than 1 and is calculated as follows:*

$$Leasing\ expense\ increase\ factor = \frac{REFY\ actual\ operating\ expense}{PY\ actual\ operating\ expense}$$

iii. *Interest expense is calculated as the PY operating lease liability (prior to adjusting for any recognised provisions) multiplied by the interest rate used to discount the MLPs.*

Furthermore, no other adjustments are made with respect to straight-lining and onerous contract provisions when determining the profit impact resulting from operating lease capitalisation. Essentially by calculating the profit impact as the movement between the equity adjustments in respect of the REFY and the PY, and then reversing the operating

lease expense and recognising interest and amortisation charges, all other aspects impacting profit are accounted for, including profit differences resulting from straight-lining and onerous contract provisions, as best possible based on the limited information available thereon.

When considering the new proposed accounting treatment, the profit impact for Type A (non-property) leases is calculated in the same way, following the aforementioned calculations under this step. However, although for Type B (property) leases the process outlined in this step will correctly result in a zero overall impact on the income statement as the lease liability and leased asset are equal, the model was adapted to exclude the reversal of the operating lease charge and deduction of interest expense as well as an amortisation charge for all Type B leases. This is due to the fact that a single operating lease expense is recognised for Type B leases, which is in line with the current accounting treatment for operating leases in terms of IAS 17; therefore no adjustments are required for Type B leases. Hence, when the "Type B lease indicator" referred to in Step 2 is turned "ON" no adjustment is made to profit in respect of property (Type B) operating leases.

Step 5: Adjusting the relevant financial statement figures

Once the balance sheet and income statement adjustments have been determined in accordance with Steps 2 to 4 then the relevant REFY and PY financial statement figures identified in Step 1 are adjusted in the model as detailed in Table 3B.

Step 6: Identifying key financial ratios to be calculated and analysed

A number of key financial ratios identified through the literature reviewed in Chapter 2 were incorporated into the model. These key financial ratios are listed in Table 3C and grouped according to the categories identified by Correia et al. (2011, pp. 5-12). Furthermore, the ratios were carefully considered to ensure that they are accurately defined (refer to the Numerator and Denominator columns of Table 3C). The ratio definitions presented by Fulbier et al. (2008, p. 129) assisted in this respect, most notably with considering the non-controlling interests (NCI) impact on the selected ratios.

A further ratio, not previously analysed with respect to the impact of operating lease capitalisation thereon, was included for analysis in this study, namely the debt-to-equity ratio (D/E) using the market value for equity. From the literature reviewed in Chapter 2 it was found that previous studies only used the book value of equity; however, analysing the impact of operating lease capitalisation on D/E based on market values is considered more useful for two main reasons: 1) the book value of equity is a historical accounting number which for well-established entities is often substantially lower than the market value of equity;

and 2) market value is determined by market forces, such as the buying and selling of equity shares by investors, and the impact of operating lease capitalisation in market value terms is likely to be more useful for market participants such as equity investors and analysts. This view is supported by Damodaran (2001, p. 106) who also further states that “using the book value of debt as a proxy for market value in those cases where bonds (debt) are not traded does not significantly shift most market-value based debt ratios” such as D/E using the market value for equity. Further, the borrowing capacity of an entity is expected to be driven by the market value of an entity"s assets and not the book value thereof. The market value of equity used in the denominator of this D/E equals the company"s market capitalisation, namely the number of shares outstanding (net of treasury shares) multiplied by the market price per share at reporting date, plus the book value of any non-controlling interests as the market value thereof is not available. Nonetheless, loan covenants generally refer to reported accounting values as opposed to market values, with most loan covenant ratios based on accounting book values. For this reason, amongst others, the conventional D/E ratio based on book values is also calculated and incorporated into the model.

Table 3B: Balance sheet and income statement adjustments arising from constructive operating lease capitalisation

Step Reference	Balance sheet figure adjusted (R)	Income statement figure adjusted (R)	Adjustment
Step 2	Non-current liabilities		Add unrecorded operating lease liability (non-current portion)
	Current liabilities		Add unrecorded operating lease liability (current portion)
Step 3	Non-current assets		Add unrecorded operating leased asset
Step 4	Retained earnings (equity)		Deduct after-tax difference between unrecorded lease liability and leased asset applicable to the company shareholders (i.e. excluding NCI)[1]
	Non-controlling interests (NCI)		Deduct after-tax difference between unrecorded lease liability and leased asset applicable to NCI[1]
	Deferred tax[2]		Adjust by tax portion (28%) of difference between unrecorded lease liability and leased asset
		Earnings before interest, tax, depreciation and amortisation (EBITDA)	Add back operating lease expense previously recognised
		Earnings before interest and tax (EBIT)	Add back operating lease expense previously recognised AND Deduct unrecorded amortisation on leased asset
		Finance charges (interest expense)	Add interest on unrecorded lease liability
		Net operating profit after tax (NOPAT)	Add back after-tax operating lease expense previously recognised AND Deduct unrecorded after-tax amortisation on leased asset
		Net profit after tax (NPAT)	Add back after-tax operating lease expense previously recognised AND Deduct unrecorded after-tax amortisation on leased asset AND Deduct after-tax interest on unrecorded lease liability
		NPAT attributable to company shareholders	Net NPAT adjustment applicable to the company shareholders (i.e. excluding NCI)[1]
		NPAT attributable to NCI	Net NPAT adjustment applicable to NCI[1]

1. The split between company shareholders and NCI is determined by the reported proportions of these figures for both equity balance and profit purposes. This split is necessary as some of the operating leases may relate to subsidiary companies which would impact the NCI figures.
2. The deferred tax adjustment (debit creating an asset) is allocated between the reported deferred tax asset and deferred tax liability balances in proportion to those disclosed amounts. This is considered the most appropriate treatment based on IAS 12 (Income Taxes) as the deferred tax balances likely arose in various companies comprising the consolidated company which would have been offset if it was premitted to do so. However, IAS 12 paragraph 74 only allows for the offset of deferred tax assets and deferred tax liabilities if an entity has a legally enforceable right to do so (considering current tax) and the deferred tax assets and the deferred tax liabilities relate to income taxes, levied by the same taxation authority on the same taxable entity or different taxable entities, which intend to be settled on a net basis or simultaneously (IASB, 2012, p. A600). Therefore, with no information regarding which deferred tax balance the operating lease adjustment relates to, it is considered most appropriate to allocate this adjustment proportionately between the disclosed deferred tax asset and liability balances.

Table 3C: Financial ratios incorporated into model

Ratio Category	Financial Ratio	Numerator	Denominator
Debt management	Debt ratio	Total debt[1]	Total assets[1]
	Debt-to-equity (book value)	Total debt[1]	Equity book value (including NCI)
	Debt-to-equity (market value)	Total debt[1]	Market capitalisation[2] + NCI
	Times interest earned	EBIT	Interest expense
Liquidity	Current ratio	Current assets	Current liabilities
Profitability	EBITDA margin	EBITDA	Revenue
	EBIT margin	EBIT	Revenue
	NPAT (net profit) margin	NPAT	Revenue
	Return on assets	NOPAT	Average total assets[1]
	Return on capital employed	NOPAT	Average capital employed[3]
	Return on equity	NPAT (excluding NCI)	Average equity book value (excluding NCI)
Asset management	Asset turnover	Revenue	Average total assets[1]
Market value	Earnings yield	NPAT (excluding NCI)	Average market capitalisation[2]
	Price-earnings	Market capitalisation[2]	NPAT (excluding NCI)
	Market-to-book	Market capitalisation[2]	Equity book value (excluding NCI)

1. Deferred tax liabilities and assets are included in total debt and total assets respectively.
2. Market capitalisation = (shares outstanding - treasury shares) x share price *[as at the end of the relevant reporting period]*
3. Capital employed = total equity + non-current liabilities OR total assets - current liabilities

Note: „Average" in the Denominator column refers to the average of the respective REFY and PY balance sheet figures.

Failure prediction:

In order to assess the impact that the capitalisation of operating leases has on the perceived creditworthiness (bankruptcy risk) of the selected companies, Altman's failure prediction model was incorporated into the model in line with Jesswein (2009) and Cornaggia et al. (2013). Altman's original Z-score model was included for analysis as many of the companies listed on the JSE are large, multi-national companies – details of this Z-score model have been covered in section 2.2.2.2 of Chapter 2.

Furthermore, Altman (2000) presented a summary of the Z-score and ZETA® models and suggested revised Z-score models (Z" and Z"). As the ZETA® credit risk model is a proprietary model that is not available for use in research studies it was ignored; however, the three versions of the Z-score model were considered. The first is Altman's original 1968 Z-score model which, as noted, has already been discussed and included in the model. The second revised model is the Z"-score model (Z") which was developed for use in the private sector where an entity's market value of equity is not readily available and is thus not applicable to this research study. Thereafter the model was further adapted for non-manufacturers in order to minimise the potential industry effect through removing one of the industry-sensitive variables, namely the asset turnover ratio (i.e. X_5 which is sales divided by total assets). This improved Z"-score model (Z") was successfully applied by Altman, most notably to emerging market entities (Altman, 2000, pp. 21-22), and is as follows:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Where, $X_1 =$ *working capital ÷ total assets*

$X_2 =$ *retained earnings ÷ total assets*

$X_3 =$ *earnings before interest and taxes ÷ total assets*

$X_4 =$ *book value of total equity ÷ book value of total liabilities*

Correia et al. (2011, pp. 5-24) further note that this revised Z"-score model has successfully been applied to emerging economies, including South Africa. In line with the original Z-score model, the higher the calculated Z"-score is, the lower the probability that the entity will experience financial distress or be forced into liquidation. Furthermore, a Z"-score greater than 2.60 indicates that the entity is unlikely to fail (low bankruptcy risky) while a Z"-score less than 1.10 is an indication that the entity is likely to fail (high bankruptcy risk). A Z"-score between 1.10 and 2.60 falls within a zone of uncertainty (Correia, et al., 2011, pp. 5-24).

Based on the fact that South Africa is an emerging economy and that the majority of companies operating within the selected sectors are non-manufacturers providing a service, the Z''-score will also be incorporated into this model for analysis. As previously noted, the fact that Altman's Z-score models were developed based on accounting figures that did not capitalise operating leases is noted as a limitation of this and similar prior research studies by Jesswein (2009) and Cornaggia et al. (2013); however, that does not invalidate the relevance of such analysis.

Step 7: Pilot sample – testing the model

In the last step the model was tested and refined by means of a pilot sample of five companies (one from each of the five selected sectors as noted in Table 3D). Appendix A sets out the final model with data that has been input from Mr Price Group Limited (MPC) – one of the companies included in the pilot sample that serves as a relevant example due to recognised straight-lining and onerous contract provisions in respect of operating leases and no interest-bearing or long-term debt on its balance sheet.

Table 3D: Details of pilot sample

Sector	Company included in pilot sample
Food & Drug Retailers	The Spar Group Limited (SPP)
General Industrials	Barloworld Limited (BAW)
General Retailers	Mr Price Group Limited (MPC)
Industrial Transportation	Grindrod Limited (GND)
Travel & Leisure	Famous Brands Limited (FBR)

3.4. Data Analysis

The data collected as well as the financial ratios and Z-scores calculated in terms of the model will be analysed in order to answer the research questions of this study. Firstly, the changes that result in the key financial ratios and Altman's Z-scores (Z and Z'') as a result of capitalising operating leases will be analysed, on average, in absolute and relative terms for all companies in the sample as well as by sector. Furthermore, the changes will be tested for significance using a two sample (paired) *t*-test, with the two samples being the average financial ratio pre-capitalisation and the average financial ratio post-capitalisation. A *t*-test is

selected for statistical analysis due to the assumed absence of a normal distribution within the sample and is in line with previous research analysing the impact of constructively capitalising operating leases in other countries (see Durocher (2008), Jesswein (2009) and Branswijck and Longueville (2011)). Additional analysis will also be conducted focusing on the new contribution by this study, namely adjusting the operating lease capitalisation model for straight-lining and onerous operating lease contract provisions already recognised. The analysis will indicate the extent to which operating lease liabilities are already recognised by way of these provisions, providing an indication of whether these provisions are material or not.

Secondly, based on the proposed accounting treatment, the results of the ILW operating lease capitalisation method will be compared to capitalisation in terms of the new exposure draft classifying leases as Type A or Type B. Results will be compared to determine if they are the same or for which financial ratios they differ substantially. In line with Beattie et al. (1998), Spearman rank correlation tests will also be used when analysing this aspect, as well as the former impact of operating lease capitalisation on ratios, in order to determine if rankings change substantially.

Thirdly, the companies with leases (operating or finance leases) will be further analysed in order to determine the proportion of the capitalised operating lease liabilities in relation to recognised finance lease liabilities and the proportion of lease liabilities in relation to other reported debt balances. Fourthly, the same companies will be analysed using linear regression analysis to determine whether the size of the company has an impact on the extent of its lease utilisation. These analyses will be performed for each of the five sectors as well.

Finally, the extent of loan covenant disclosure will be analysed as well as whether the capitalisation of operating leases results in the breach of any disclosed loan covenants.

3.5. Conclusion

This chapter has detailed the development of the constructive operating lease capitalisation model used in this study. Furthermore, 53 JSE-listed companies from five sectors have been identified for which annual financial statements will be reviewed and data input into the model. The statistical and related analyses that are to be performed on the data collected using the model were detailed, indicating how the research questions will be answered. Chapter 4 follows with the results of the lease capitalisation model developed, as well as a detailed analysis of the results of the study.

Chapter 4: Results and Analysis

4.1. Introduction

This chapter outlines details of the final sample of companies included in this research study for which data was collected (section 4.2), as well as the results of the data collected and analysis thereof (section 4.3). The data collected was analysed in line with section 3.4 of the previous chapter in order to address all the research questions of this research study. Section 4.4 concludes on the research results and analysis performed.

4.2. Data Selection

As noted in section 3.2 and Table 3A, all companies listed on the JSE Main Board falling within five sectors were initially selected for testing and based thereon the population comprised 53 companies. However, as noted in Table 4A, five companies were excluded from this research study – two companies were excluded as they are the only subsidiary of holding companies included in the initial population selected and a further three companies were excluded as their annual financial statements could not be obtained or there was insufficient disclosure relating to future minimum operating lease payments. Therefore a final sample of 48 JSE-listed companies was analysed in this research study – refer to Appendix B for a complete listing thereof.

It is relevant to note that no companies were excluded from this research study based on the exclusion criteria detailed in section 3.2, as all the operating lease disclosures reviewed for each company in the final sample included either one or both of the following voluntary disclosures:

- Non-cancellable future minimum lease payments split between property and non-property.
- Operating lease rental expense split between property and non-property (note: for two companies this was not disclosed; however, it could be confidently assumed that all material operating leases entered into by these companies related to property due to the nature of their operations and statements in their annual report).

Table 4A: Selected and excluded companies – by sector

Sector	JSE Listed Companies	Companies Excluded*	Companies Investigated
Food & Drug Retailers	5	1	4
General Industrials	11	-	11
General Retailers	18	1	17
Industrial Transportation	7	-	7
Travel & Leisure	12	3	9
Five sectors (entire sample)	53	5	48

* Details of the five listed companies excluded are provided below:

Pick n Pay Stores Limited (PIK), in the Food and Drug Retailers sector, and Rex Trueform Clothing Company Limited (RTO), in the General Retailers sector – These companies were excluded as they are subsidiaries of holding companies included in the population of companies selected whose sole business is that of owning a controlling interest in the said subsidiary i.e. these companies results are fully consolidated into their holding company"s results and including them would amount to double counting and distortion of research results and conclusions drawn in this study. Pick n Pay Stores Limited (PIK) is a subsidiary of Pick n Pay Holdings Limited (PWK) while Rex Trueform Clothing Company Limited (RTO) is a subsidiary of African and Overseas Enterprises Limited (AOO).

1Time Holdings Limited (1TM), in the Travel & Leisure sector – The company"s shares were suspended for trading on 2 November 2012 therefore the annual financial statements for the most recent financial year ended 31 December 2012 could not be obtained. The annual financial statements for the previous financial year ended 31 December 2011 were obtained and reviewed for inclusion; however, despite having entered into operating leases, there was no disclosure of future minimum operating lease payments. 1Time Holdings Limited (1TM) was therefore excluded from the sample.

IFA Hotels & Resorts Limited (IFH), in the Travel & Leisure sector – Despite the company having entered into operating leases, there was no disclosure of future minimum operating lease payments, therefore IFA Hotels & Resorts Limited (IFH) was excluded from the sample.

The Don Group Limited (DON) , in the Travel & Leisure sector – All attempts to obtain the company"s most recent annual financial statements were unsuccessful. This included contacting the company via email and telephone, searching on the Internet and contacting the JSE. The Don Group Limited (DON) was therefore excluded from the sample.

4.3. Data Analysis

The primary aim of the research results and analysis presented in this section is to address the four research questions from section 1.2 as detailed in sections 4.3.1 to 4.3.4. Furthermore, section 4.3.5 provides additional analysis of ancillary issues relating to straight-lining and onerous contract provisions relating to operating leases examined as well as information collected relating to loan covenants.

However, as a prelude to the analysis which follows, a summary of the interest rates used to discount the future minimum lease payments of the companies investigated in this study was analysed. As detailed in Step 2 of section 3.3, in line with the proxies suggested by Imhoff et al. (1997), a company-specific interest rate could be established for 35 companies while the prime lending rate was used for the remaining 13 companies. Pertinent statistics relating to the interest rate established by way of the aforementioned proxies for the 35 companies are presented in Table 4B. These statistics provide comfort that the interest rates calculated and used to discount the future minimum lease payments of the various companies are reasonable in light of the prevailing South African prime lending rate of 8.5%. Nonetheless, as noted by Durocher (2008, p. 241), the wide range of interest rates, varying from 6.50%[16] to 12.68% in this research study, arise due to the specific risk premium associated with a particular company and confirms the importance of using a company-specific discount rate wherever possible.

Table 4B: Interest rate summary statistics (n = 35)

Summary statistic	%
Average (mean)	8.75%
Median	8.50%
Standard deviation	1.67%
Maximum	12.68%
Minimum	6.50%

[16] This lowest rate of 6.50% related to Pick n Pay Holdings Limited (PWK) and was the interest rate disclosed for their finance leases (prime lending rate less 2%). This low rate and all other company-specific interest rates are considered appropriate in light of the yield on the R157 Government Bond (a proxy used for the South African risk-free rate) which was 6.16% on 9 September 2013 (Rand Merchant Bank, 2014) – the date the sample was selected.

It is to be noted that all the analyses performed within the remainder of section 4.3 are based on the conventional operating lease capitalisation model developed ignoring the impact of the new proposed lease accounting rules, except for section 4.3.2 which deals with the consequences of the new proposed accounting treatment for leases (classifying lease agreements either as Type A leases or Type B leases).

4.3.1. Results of Research Question 1

Research Question 1: *Does constructive capitalisation of future non-cancellable operating lease commitments (x_1) have a significant impact on key financial statement ratios (y_1) and failure prediction indicators (y_2) of South African companies?*

When constructively capitalising the future minimum operating lease payments for the 48 companies analysed, the average increase in a company"s total debt balance due to the unrecognised operating lease liabilities (after taking into account recognised straight-lining and onerous contract provisions relating to operating leases already recognised) was 33.7% with a standard deviation of 44.5%, while the median increase was 18.1%. Furthermore, the average and median increases in total assets due to the associated unrecognised leased assets were 11.3%[17] and 8.1% respectively (standard deviation of 11.0%). However, there was an average (median) decrease in net profit after tax of 2.4% (0.4%) with a standard deviation of 10.7%. Further statistics related to the increase in liability and asset balances are reflected in Table 4C together with the associated change in net profit (note: the statistics presented in Table 4C ignore any deferred tax balances that arise through the constructive capitalisation process due to the deferred tax adjustment being proportionately allocated between debt and asset deferred tax balances).

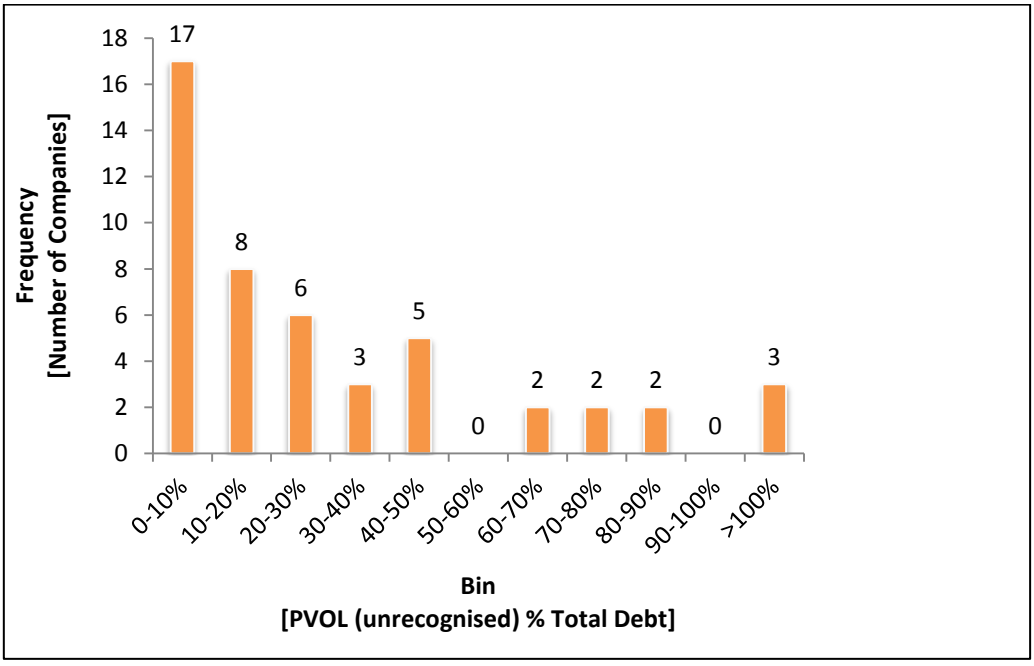
The balance sheet impact is clearly substantial with half of the sampled companies experiencing an increase in debt and asset balances in excess of 18.1% and 8.1% respectively in relation to reported balances. However, although the increase in debt varied between a low of 0.2% and a high of 226.8%, the histogram presented in Graph 4A indicates that for the majority of companies within the sample (25 companies representing 52.1%) unrecognised operating lease liabilities were less than 20% of total reported debt.

[17] The large difference noted between the increase in debt (average of 33.7%) and increase in assets (average of 11.3%) arising from operating lease capitalisation is due to the following two reasons:
1) The leased asset value is calculated using the asset ratio discussed in section 2.2.1 and is therefore reflected at an amount which is less than the associated lease liability; and
2) The asset base of an entity is the sum of the entity"s equity and debt, hence the average increase in assets is calculated using a higher denominator which results in a smaller percentage change when compared to the increase in debt calculation.

Table 4C: Impact of constructive capitalisation of operating leases on total debt, total assets and net profit – descriptive statistics (n = 48)

Descriptive Statistic	Unrecognised Lease Liability *percentage of* Total Recognised Debt	Unrecognised Leased Asset (amortised) *percentage of* Total Recognised Assets	Profit Adjustment (after tax) *percentage of* Reported Net Profit After Tax
Minimum	0.2%	0.1%	-44.6%
1st Quartile	6.8%	2.9%	-3.7%
Median (2nd Quartile)	18.1%	8.1%	-0.4%
3rd Quartile	41.0%	17.4%	0.8%
Maximum (4th Quartile)	226.8%	40.7%	21.6%
Mean	33.7%	11.3%	-2.4%
Standard deviation	44.5%	11.0%	10.7%

Graph 4A: Histogram of the present value of unrecognised operating lease liabilities as a percentage total recognised debt



Although the income statement impact for the sample of companies ranges from a decrease in net profit after tax of 44.6% to an increase of 21.6%, 35 companies (72.9% of the sample) experienced a small change in net profit after tax of between -4.6% and +4.3%. The income statement is therefore less affected than the balance sheet when constructively capitalising operating leases and as such balance sheet related financial statement ratios will be more affected than profitability ratios. Furthermore, an analysis of the impact on net profit indicated that for 19 companies (39.6% of the sample) net profit increased while for the other 29 companies (60.4% of the sample) net profit decreased when capitalising operating leases.

When considering the five sectors analysed, Table 4D indicates that retailers (Food & Drug Retailers and General Retailers) are the most impacted with respect to changes in debt, assets and net profit arising from operating lease capitalisation. This is most likely due to substantial property rental agreements entered into by retailers for their retail space which is the most material asset retailers require for their business. A similar argument also applies to companies within the Travel & Leisure sector that are also substantially impacted. On the other hand General Industrials were least affected with the mean percentage changes ranging from 0.6% for profit to 6.4% for debt.

Table 4D: Impact of constructive capitalisation of operating leases on total debt, total assets and net profit – mean by sector

Sector	*n*	Unrecognised Lease Liability *percentage of* Total Recognised Debt	Unrecognised Leased Asset (amortised) *percentage of* Total Recognised Assets	Profit Adjustment (after tax) *percentage of* Reported Net Profit After Tax
Food & Drug Retailers	4	44.5%	24.1%	-12.6%
General Industrials	11	6.4%	2.5%	0.6%
General Retailers	17	59.7%	16.5%	-0.2%
Industrial Transportation	7	16.4%	8.5%	-6.1%
Travel & Leisure	9	26.7%	9.3%	-2.8%
Five sectors (entire sample)	48	33.7%	11.3%	-2.4%

4.3.1.1. Impact of Capitalising Operating Leases on Financial Statement Ratios

The capitalisation of future minimum operating lease payments disclosed for the sample of companies investigated revealed a change in all fifteen financial statement ratios analysed, as indicated in Table 4E. The statistical significance of the changes noted in Tables 4E, as well as the related tables that follow, was tested using a two-tailed, paired *t*-test as justified in section 3.4.

Table 4E: Impact of constructive capitalisation of operating leases on financial statement ratios – descriptive statistics (n = 48)

Financial Ratio	Mean Pre-capitalisation (reported figures)	Mean Post-capitalisation	Mean Absolute Change (Sign.)^	Mean Relative Change (Sign.)^	*t*-Test* *p*-value	Spearman Rank Correlation Coefficient
Debt ratio	51.3%	57.8%	6.5%(1)	17.2%(1)	0.000	0.928
Debt-to-equity (book value)	138.1%	212.8%	74.7%(5)	47.1%(5)	0.019	0.928
Debt-to-equity (market value)	79.4%	92.5%	13.1%(1)	33.4%(1)	0.000	0.971
Times interest earned#	111.2	8.0	-103.6	-33.6%	0.222	0.860
Current ratio	1.73	1.48	-0.25 (1)	-10.6%(1)	0.001	0.982
EBITDA margin	15.8%	18.6%	2.9%(1)	58.7%(1)	0.000	0.962
EBIT margin	11.8%	12.4%	0.6%(1)	8.3%(1)	0.000	0.994
NPAT (net profit) margin	7.3%	7.2%	-0.1%	-2.4%	0.111	0.985
Return on assets	10.9%	10.2%	-0.6%(1)	-1.9%(1)	0.008	0.975
Return on capital employed	17.1%	15.6%	-1.5%(1)	-3.6%(1)	0.002	0.970
Return on equity	20.9%	22.8%	1.8%(5)	4.7%(5)	0.015	0.986
Asset turnover	1.75	1.52	-0.23(1)	-9.7%(1)	0.000	0.987
Earnings yield	8.1%	7.9%	-0.2%	-2.4%	0.199	0.974
Price-earnings	18.62	19.56	0.94	4.0%	0.113	0.972
Market-to-book	3.38	4.00	0.62(5)	9.0%(5)	0.030	0.992

^ Figures in parenthesis next to mean absolute and relative ratio changes indicate statistical significance of a two-tailed, paired *t*-test ([1] = significant at 1% level; [5] = significant at 5% level; [10] = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

* Statistical significance examined using a two-tailed, paired *t*-test.

\# Times interest earned ratio statistics excludes two companies (both General Retailers) that did not have any interest expense pre-capitalisation (i.e. n = 46).

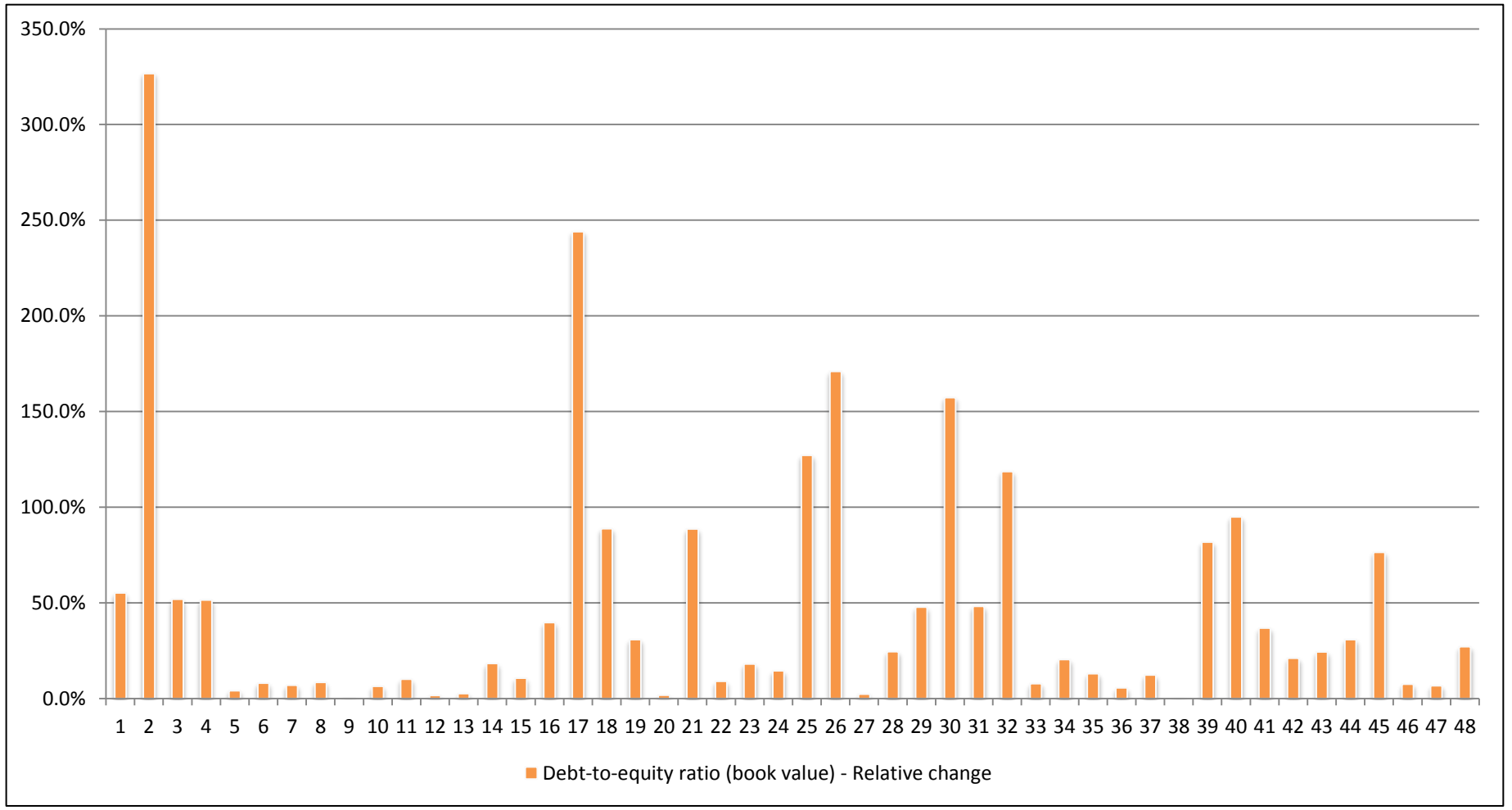
All debt-related (leverage) ratios increased substantially on average with the debt-to-equity ratio (based on book values) experiencing the largest absolute mean change of 74.7 percentage points (significant at the 5% level). However, as expected based on Graph 4A, this change is distorted by a few outliers within the sample as indicated in Graph 4B. Four companies experienced a relative change in their debt-to-equity ratio (based on book values) that exceeded 150%, while the greatest outlier thereof was a substantial change of 326.7% relating to Pick n Pay Holdings Limited (PWK) – company 2 in Graph 4B.

Nonetheless, the relative change in the debt-to-equity ratio (based on book values) exceeded 20% for 25 companies (52.1% of the sample). Furthermore, when only excluding Pick n Pay Holdings Limited (PWK), the average post-capitalisation debt-to-equity ratio (based on book values) fell to 177.4% (previously 212.8%) for the remaining 47 companies, while the mean relative change decreased to 41.2% (previously 47.1%) which was found to be significant at the 1% level (previously significant at the 5% level).

The times interest earned ratio also decreased by a substantial number of 103.6 times on average, equating to a -33.6% mean relative change; however, this change was not statistically significant as it was skewed by three companies with excessively high pre-capitalisation interest coverage ratios in excess of 288 times. When these three companies were excluded the mean pre-capitalisation times interest earned ratio decreased to 13.7 times; however, the mean relative change only decreased to -29.2% but this change was found to be significant at the 2% level. Therefore, in addition to the leverage ratios, this indicates that the capitalisation of operating leases also has both a substantial and significant impact on the times interest earned ratio of companies within the five sectors analysed.

Furthermore, the average current ratio decreased by 10.6%, a change that was also found to be significant at the 1% level. Although most of the other changes noted in the selected ratios were smaller, the majority of changes also proved to be statistically significant at the 1% level. In addition, as expected based on the results of Table 4C, most of the profitability ratios had smaller changes compared to the changes in balance sheet ratios; however, the average EBITDA margin percentage increased by 58.7% (significant at the 1% level) due to the removal of the operating lease expense and the inclusion of a smaller amortisation charge relating to the capitalised leased asset. This is a substantial change in an important number that is used by many analysts and investors as a proxy for the free cash flow of an entity arising from operations. Although the mean changes were substantially lower for other profitability ratios, the average EBIT margin and return on equity profitability ratios also increased, while the net profit (after tax) margin, return on assets, return on capital employed and earnings yield profitability ratios decreased.

Graph 4B: Relative change in debt-to-equity (book value) ratio when capitalising operating leases for each company



The recognition of an operating leased asset resulted in a decrease of 9.7% in the average asset turnover ratio (significant at the 1% level), while both the average price-earnings and market-to-book ratios increased due to the average reduction in earnings (net profit after tax) and debit (decrease) to equity (retained earnings) arising from the operating lease capitalisation adjustments.

Despite the aforementioned substantial and significant changes resulting to financial statement ratios when operating leases are capitalised, the ranking of companies in the sample did not change greatly when comparing their rankings before and after the capitalisation of operating leases. This is evidenced by the Spearman rank correlation coefficients in the last column of Table 4E being close to 1.000, indicating a strong positive relationship between the ranks pre- and post-capitalisation.

The preceding results relating to the impact of operating lease capitalisation on financial statement ratios are in line with the results of prior research studies noted in section 2.2.2.1, except for two contradictions noted. Firstly Beattie et al. (1998, p. 251) identified that for certain ratios, especially gearing ratios, the Spearman rank correlation of the ratio before and after capitalisation changed substantially. This can be ascribed to the fact that in the research study by Beattie et al. a larger, randomly selected sample was chosen which would have included a number of entities without operating leases while all companies analysed in this research study had operating leases (refer Table 4O). Further, when comparing these results to the research findings of de Villiers and Middelberg (2013) relating to a smaller sample of JSE-listed companies within the Top 40 index, notable differences were identified. Firstly, their findings indicated substantially smaller changes in the debt-to-equity ratio (based on book values) and the times interest earned ratio analysed pre- and post-adjustment for off-balance sheet operating leases. The mean relative debt-to-equity (times interested earned) ratio change noted in this research study was an increase of 41.2% (decrease of 29.2%) when excluding the outlier(s) noted, compared to the 9% increase (8% decrease) noted by de Villiers and Middelberg (2013, p. 663). Furthermore, contrary to the findings of this research study, de Villiers and Middelberg (2013, pp. 664-666) noted substantial changes in profitability and market ratios when capitalising operating leases for their sample of companies. As indicated in section 2.2.2.1, the likely reason for these differences is that the JSE Top 40 index includes very few companies that operate within the five sectors analysed in this research study that make substantial use of operating leases. However, as previously noted, there could be numerous other reasons for these differences noted such as the size of the companies in the respective samples.

4.3.1.2. Impact of Capitalising Operating Leases on Altman's Failure Prediction Indicators

Table 4F indicates the impact that the capitalisation of operating leases has on two of Altman's failure prediction models, namely the original Z-score model and the revised Z''-score model, including the supporting variables. As indicated, all changes noted in the table are statistically significant at the 1% level.

The greatest impact is clearly on the mean of the X_4 variable for both the original Z-score model and the revised Z''-score model, as well as the mean model results (the Z-score and Z''-score values). This is intuitive as the X_4 variable is the market value (Z) or book value (Z'') of total equity divided by book value of total liabilities which is the debt-equity ratio which changed substantially and significantly as per Table 4E.

Table 4F: Impact of constructive capitalisation of operating leases on Altman's failure prediction models – descriptive statistics (n = 48)

Z-score variable	Mean Pre-capitalisation (reported figures)	Mean Post-capitalisation	Mean Absolute Change (Sign.)^	Mean Relative Change (Sign.)^	*t*-Test* *p*-value	Spearman Rank Correlation Coefficient
Z/Z''-score - X_1	0.14	0.09	-0.05(1)	-56.6%(1)	0.000	0.969
Z/Z''-score - X_2	0.39	0.33	-0.06(1)	-16.7%(1)	0.000	0.971
Z/Z''-score - X_3	0.14	0.13	-0.01(1)	-1.6%(1)	0.010	0.970
Z-score - X_4	4.32	2.97	-1.36(1)	-19.7%(1)	0.008	0.971
Z-score - X_5	1.64	1.43	-0.21(1)	-9.7%(1)	0.000	0.986
Z-score (Z)	5.42	4.22	-1.20(1)	-15.1%(1)	0.001	0.947
Revised Z''-score - X_4	1.41	1.04	-0.37(1)	-23.7%(1)	0.001	0.928
Revised Z''-score (Z'')	4.65	3.69	-0.96(1)	-22.2%(1)	0.000	0.959

^ Figures in parenthesis next to mean absolute and relative variable changes indicate statistical significance of a two-tailed, paired *t*-test (^{1} = significant at 1% level; ^{5} = significant at 5% level; ^{10} = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

* Statistical significance examined using a two-tailed, paired *t*-test.

In line with the change that resulted in the financial statement ratios, Spearman rank correlation coefficients indicate that the impact of capitalising operating leases on Altman's failure prediction models do not change the rankings of variables considerably when

comparing their ranks before and after capitalisation. Despite the rankings remaining very much the same, the change in the variables and results of Altman"s failure prediction models resulted in a change in the classification of 5 companies (10.4% of sample) under the original Z-score model and 11 companies (22.9% of sample) under the revised Z""-score model. All such classification changes were either a movement from „unlikely to fail" into the „zone of uncertainty" or from the „zone of uncertainty" to „likely to fail", effectively a deterioration in the company"s bankruptcy risk status on paper. The classifications for both models, before and after the capitalisation of operating leases, are reflected in table 4G.

These findings are consistent with those of Jesswein (2009) and Cornaggia et al. (2013) noted in section 2.2.2.2, although they only focused on the original Z-score model. As previously noted, the decrease noted in a company"s Z/Z""-score as a result of capitalising operating leases does not make the company more risky or susceptible to bankruptcy than it was prior to the lease capitalisation adjustment but the revised figure may present a more reliable Z/Z""-score incorporating the additional financial risk of off-balance sheet debt.

Table 4G: Altman's failure prediction model classifications before and after constructive capitalisation of operating leases

Classification	Original Z-score model		Revised Z""-score model	
	Pre-capitalisation	Post-capitalisation	Pre-capitalisation	Post-capitalisation
Number of companies *unlikely to fail* (low bankruptcy risk)	34	30	37	27
Number of companies in the *zone of uncertainty*	11	14	7	16
Number of companies *likely to fail* (high bankruptcy risk)	3	4	4	5
Total number of companies	48	48	48	48

4.3.1.3. Impact of Capitalising Operating Leases on Various Sectors

Table 4H and 4I present the impact of capitalising future minimum operating lease payments on financial statement ratios and Altman"s failure prediction model for each of the five sectors investigated. In line with the results indicating the magnitude of off-balance sheet

lease liabilities and the related leased assets for the sample presented in Table 4D, retailers (Food & Drug Retailers and General Retailers) were the most affected when capitalising operating leases, followed by the Travel & Leisure sector and then the Industrial Transportation sector. Food & Drug Retailers experienced a substantial absolute mean increase of 442.1 percentage points in the debt-to-equity ratio based on book values which was skewed, and hence not statistically significant, as a result of one outlier company previously identified, namely Pick n Pay Holdings Limited (PWK), for which the debt-to-equity ratio rose from 440.1% to a remarkably high figure of 1,877.9%. However, when this one outlier company is excluded then the absolute mean increase in the debt-to-equity ratio remains substantial at 110.2 percentage points which is significant at the 5% level. Furthermore, each sector‟s financial statement ratio results, as well as the results of Altman‟s failure prediction models for each sector, follow a similar trend to the preceding aggregated results analysed, with the majority of changes being significant at the 1%, 5% or 10% significance levels.

Table 4J indicates the Spearman rank correlation coefficient for all the financial statement ratios and Altman‟s failure prediction model variables and Z/Z‟‟-scores for each sector based on rankings before and after capitalising operating leases. In line with the aggregated results, most of the Spearman rank correlation coefficients indicate a strong positive relationship between the ranks pre- and post-capitalisation; however, the Industrial Transportation sector‟s results are generally lower than the other four sectors indicating a greater change in the rankings within that sector than others, especially for the leverage, times interest earned and certain profitability ratios as well as the Z‟‟-score value. Nonetheless, in line with the aggregated results, the change in Altman‟s failure prediction indicators resulted in a change in the classification of some of the companies within each sector (effectively a fall in bankruptcy risk status) as indicated in Table 4K. These results confirm that the aggregated classification changes noted in Table 4G were not isolated to any particular sector but rather spread across the five sectors; however, it is evident that a larger proportion of Industrial Transportation companies experienced a deterioration in their bankruptcy risk status as measured by Altman‟s failure prediction models (the same can be said for Food & Drug Retailers based on the revised Z‟‟-score model).

The sector results confirm prior research findings noted in section 2.2.2.3 that the five selected sectors analysed in this research study make extensive use of operating leases and therefore operating lease capitalisation substantially impacts the financial statement ratios and Altman‟s failure prediction indicators of the companies within each of those sectors.

Table 4H: Impact of constructive capitalisation of operating leases on financial statement ratios – descriptive statistics by sector

Sector	Food & Drug Retailers (n = 4)			General Industrials (n = 11)			General Retailers (n = 17)			Industrial Transportation (n = 7)			Travel & Leisure (n = 9)		
Financial ratio	Mean Pre-OL*	Mean Post-OL*	Mean Absolute Change (Sign.)^	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)
Debt ratio	69.8%	79.6%	9.8%(1)	47.7%	49.2%	1.5%(1)	44.7%	54.9%	10.1%(1)	60.7%	64.6%	3.9%(10)	52.6%	58.8%	6.2%(1)
Debt-to-equity (book value)	265.6%	707.7%	442.1%	116.0%	123.3%	7.4%(1)	112.3%	176.4%	64.1%(5)	164.1%	190.9%	26.7%(10)	137.0%	188.0%	51.0%(5)
Debt-to-equity (market value)	42.9%	69.0%	26.1%	107.8%	112.4%	4.6%(1)	57.4%	72.9%	15.4%(1)	144.2%	160.9%	16.7%(5)	51.9%	62.2%	10.3%(5)
Times interest earned#	23.8	5.8	-18.0	13.3	9.9	-3.3(10)	29.9	7.7	-23.7	5.7	4.2	-1.4(5)	487.4	10.4	-477.0
Current ratio	1.13	1.02	-0.11(5)	1.98	1.89	-0.09(5)	2.29	1.75	-0.54(5)	1.29	1.22	-0.07(5)	0.97	0.86	-0.11(1)
EBITDA margin	5.5%	7.3%	1.9%(1)	17.1%	18.0%	0.9%(1)	12.0%	16.7%	4.7%(1)	18.8%	20.9%	2.1%(10)	23.3%	26.2%	2.9%(1)
EBIT margin	4.4%	4.7%	0.4%(5)	11.4%	11.7%	0.3%(1)	9.8%	10.8%	1.0%(1)	13.2%	13.2%	0.1%	18.4%	19.3%	0.9%
NPAT (net profit) margin	2.9%	2.7%	-0.2%	7.1%	7.1%	0.0%(10)	5.4%	5.4%	0.0%	9.0%	8.7%	-0.4%	11.7%	11.5%	-0.2%
Return on assets	11.3%	10.1%	-1.2%(1)	8.1%	8.1%	0.0%	12.6%	11.6%	-1.0%	7.5%	7.0%	-0.5%	13.4%	12.7%	-0.7%(10)
Return on capital employed	31.1%	23.1%	-8.0%(5)	11.5%	11.6%	0.0%	18.5%	16.9%	-1.6%(5)	12.3%	11.5%	-0.8%	18.9%	18.1%	-0.8%
Return on equity	37.1%	42.8%	5.6%(10)	13.4%	13.7%	0.2%(5)	20.2%	22.2%	2.0%(5)	15.8%	15.1%	-0.8%	28.3%	32.1%	3.8%
Asset turnover	4.02	3.19	-0.83(5)	1.27	1.23	-0.04(5)	1.79	1.47	-0.32(1)	1.76	1.66	-0.10(5)	1.22	1.11	-0.11(1)
Earnings yield	4.5%	4.1%	-0.4%	10.4%	10.5%	0.1%	5.7%	5.7%	0.0%	12.7%	11.9%	-0.8%	7.8%	7.5%	-0.3%
Price-earnings	25.63	32.11	6.48	11.26	11.21	-0.05	26.37	26.84	0.47	9.30	10.36	1.06	17.10	17.56	0.46
Market-to-book	8.21	11.99	3.78	1.45	1.46	0.01	3.64	4.13	0.49(10)	1.40	1.44	0.05	4.63	5.30	0.66

* Pre-OL and Post-OL refer to pre-capitalisation of operating leases (i.e. using reported figures) and post-capitalisation of operating leases respectively.

^ Figures in parenthesis next to mean absolute ratio changes indicate statistical significance of a two-tailed, paired *t*-test ([1] = significant at 1% level; [5] = significant at 5% level; [10] = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

Times interest earned ratio statistics excludes two companies (both General Retailers) that did not have any interest expense pre-capitalisation (i.e. for General Retailers n = 15).

Table 4l: **Impact of constructive capitalisation of operating leases on Altman's failure prediction models – descriptive statistics by sector**

Sector	Food & Drug Retailers (n = 4)			General Industrials (n = 11)			General Retailers (n = 17)			Industrial Transportation (n = 7)			Travel & Leisure (n = 9)		
Z-score variable	Mean Pre-OL*	Mean Post-OL*	Mean Absolute Change (Sign.)^	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)	Mean Pre-OL	Mean Post-OL	Mean Absolute Change (Sign.)
Z/Z""-score - X_1	0.05	-0.00	-0.05$^{(1)}$	0.18	0.17	-0.01$^{(1)}$	0.25	0.15	-0.09$^{(1)}$	0.08	0.05	-0.02$^{(5)}$	-0.00	-0.03	-0.03$^{(1)}$
Z/Z"'-score - X_2	0.28	0.19	-0.08$^{(1)}$	0.40	0.39	-0.01$^{(1)}$	0.44	0.35	-0.09$^{(1)}$	0.25	0.22	-0.03	0.43	0.37	-0.06$^{(1)}$
Z/Z""-score - X_3	0.15	0.14	-0.02$^{(1)}$	0.11	0.11	0.00	0.17	0.15	-0.01	0.09	0.08	-0.01	0.18	0.17	-0.01
Z-score - X_4	3.46	2.49	-0.97$^{(5)}$	2.39	2.25	-0.14$^{(5)}$	6.85	4.00	-2.85$^{(5)}$	0.86	0.73	-0.12$^{(10)}$	4.99	3.82	-1.16$^{(5)}$
Z-score - X_5	3.79	3.00	-0.79$^{(5)}$	1.21	1.17	-0.04$^{(5)}$	1.69	1.39	-0.30$^{(1)}$	1.60	1.50	-0.10$^{(5)}$	1.14	1.04	-0.10$^{(1)}$
Z-score (Z)	6.82	5.21	-1.60$^{(1)}$	3.78	3.63	-0.15$^{(1)}$	7.25	4.97	-2.29$^{(5)}$	2.86	2.59	-0.27$^{(10)}$	5.32	4.37	-0.95$^{(5)}$
Z"-score - X_4	0.46	0.28	-0.18$^{(5)}$	1.67	1.57	-0.10$^{(1)}$	1.94	1.19	-0.75$^{(5)}$	0.67	0.56	-0.11$^{(10)}$	1.11	0.83	-0.28$^{(5)}$
Z"-score (Z")	2.77	1.83	-0.93$^{(1)}$	4.98	4.74	-0.23$^{(1)}$	6.19	4.42	-1.76$^{(1)}$	2.65	2.22	-0.43$^{(10)}$	3.76	3.01	-0.75$^{(1)}$

* Pre-OL and Post-OL refer to pre-capitalisation of operating leases (i.e. using reported figures) and post-capitalisation of operating leases respectively.

^ Figures in parenthesis next to mean absolute variable changes indicate statistical significance of a two-tailed, paired *t*-test (^{1} = significant at 1% level; ^{5} = significant at 5% level; ^{10} = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

Table 4J: **Impact of constructive capitalisation of operating leases on sector rankings (pre-capitalisation versus post-capitalisation) – Spearman rank correlation coefficient of financial statement ratios and Altman's failure prediction models, by sector**

Financial ratio / Z-score variable	Food & Drug Retailers (n = 4)	General Industrials (n = 11)	General Retailers (n = 17)	Industrial Transportation (n = 7)	Travel & Leisure (n = 9)
Debt ratio	1.000	0.973	0.914	0.714	0.900
Debt-to-equity (book value)	1.000	0.973	0.914	0.714	0.900
Debt-to-equity (market value)	1.000	0.991	0.914	0.929	0.967
Times interest earned[#]	1.000	0.982	0.850	0.500	0.817
Current ratio	1.000	0.991	0.958	1.000	1.000
EBITDA margin	0.800	1.000	0.951	0.893	1.000
EBIT margin	1.000	1.000	1.000	0.964	0.983
NPAT (net profit) margin	1.000	1.000	0.990	0.679	1.000
Return on assets	1.000	1.000	0.985	0.714	0.983
Return on capital employed	1.000	0.982	0.934	0.893	0.967
Return on equity	0.800	0.973	0.995	0.964	0.983
Asset turnover	0.800	1.000	0.980	0.857	0.967
Earnings yield	0.800	0.991	0.993	0.750	0.983
Price-earnings	0.800	0.991	0.971	0.607	0.983
Market-to-book	0.400	1.000	0.988	0.964	0.983
Z/Z"'-score - X_1	1.000	0.982	0.936	0.821	0.967
Z/Z"-score - X_2	1.000	0.991	0.983	1.000	0.967
Z/Z"'-score - X_3	1.000	0.991	0.985	0.607	0.950
Z-score - X_4	1.000	0.991	0.914	0.929	0.967
Z-score - X_5	0.800	0.991	0.968	0.964	0.983
Z-score (Z)	0.400	1.000	0.831	0.893	0.967
Z"-score - X_4	1.000	0.973	0.914	0.714	0.900
Z"-score (Z")	1.000	1.000	0.949	0.464	0.967

[#] Times interest earned ratio statistics excludes two companies (both General Retailers) that did not have any interest expense pre-capitalisation (i.e. for General Retailers n = 15).

Table 4K: Altman's failure prediction model classification changes resulting from constructively capitalising operating leases – by sector

Sector	*n*	Companies with classification changes	
		Original Z-score model	Revised Z''-score model
Food & Drug Retailers	4	0 (0%)	2 (50%)
General Industrials	11	1 (9.1%)	2 (18.2%)
General Retailers	17	1 (5.9%)	2 (11.8%)
Industrial Transportation	7	2 (28.6%)	3 (42.9%)
Travel & Leisure	9	1 (11.1%)	2 (22.2%)
Five sectors (entire sample)	48	5 (10.4%)	11 (22.9%)

In conclusion, considering the research results presented in this section, constructive capitalisation of future non-cancellable operating lease commitments has a significant impact on key financial statement ratios and failure prediction indicators of South African companies, most notably debt-related ratios with retailers being the most affected.

4.3.2. Results of Research Question 2

Research Question 2: *Does the new proposed accounting treatment for Type A and Type B leases (x_2) have substantially the same impact on key financial statement ratios (y_1) and failure prediction indicators (y_2) as the conventional operating lease capitalisation method (x_1)?*

As mentioned in section 2.3.2, the new proposed accounting treatment in terms of the revised exposure draft (ED/2013/6) classifies a lease agreement as either a Type A lease (if it relates to the rental of a non-property asset) or a Type B lease (if it relates to the rental of property). Nonetheless, the new proposed accounting treatment essentially only differs conceptually in two main respects when compared to the conventional capitalisation model applied in the previous section for Type B leases, namely 1) the recognised leased asset equals the recognised lease liability over the entire term of the lease, and 2) a single operating lease charge is accounted for as opposed to separate interest and amortisation charges relating to the lease liability and leased asset respectively. These differences imply

that for Type B leases the leased asset recognised will be greater and there will be no equity adjustment when capitalising future minimum operating lease payments as compared to the conventional operating lease capitalisation model. Furthermore, for Type B leases current year profit will essentially be the same as the current accounting treatment for operating leases in terms of IAS 17, while Type A leases are principally treated the same way under ED/2013/6 as the conventional operating lease capitalisation model.

Therefore, when comparing the results of lease capitalisation in terms of the new proposed accounting treatment to the conventional constructive operating lease capitalisation model, only the asset, equity and net profit figures will differ (not the lease liability). This is confirmed in Table 4L. Furthermore, as a result of the new proposed accounting treatment for Type B leases the figures in Table 4L reveal that the change in assets is greater while the impact on net profit after tax is more moderate.

Table 4L: Impact of constructive capitalisation of operating leases on total debt, total assets and net profit – descriptive statistics for conventional capitalisation and new proposed accounting treatment for Type A and Type B leases (n = 48)

Descriptive Statistic	Unrecognised Lease Liability *percentage of* Total Recognised Debt	Unrecognised Leased Asset (amortised) *percentage of* Total Recognised Assets	Profit Adjustment (after tax) *percentage of* Reported Net Profit After Tax
Minimum	0.2% (0.2%)	0.2% (0.1%)	-8.4% (-44.6%)
1st Quartile	6.8% (6.8%)	3.3% (2.9%)	-0.1% (-3.7%)
Median (2nd Quartile)	18.1% (18.1%)	9.0% (8.1%)	0.0% (-0.4%)
3rd Quartile	41.0% (41.0%)	22.4% (17.4%)	0.0% (0.8%)
Maximum (4th Quartile)	226.8% (226.8%)	56.2% (40.7%)	4.5% (21.6%)
Mean	33.7% (33.7%)	14.2% (11.3%)	-0.2% (-2.4%)
Standard deviation	44.5% (44.5%)	14.3% (11.0%)	1.6% (10.7%)

Note: Figures in parentheses relate to conventional operating lease capitalisation, as reflected in Table 4C. Figures preceding the parentheses relate to the capitalisation of operating leases based on the new proposed accounting treatment in terms of ED/2013/6 for Type A and Type B leases.

Table 4M and Table 4N indicate the impact of the new proposed accounting treatment on financial statement ratios and Altman"s failure prediction models respectively. The tables

include the pre-capitalisation mean results as well as the post-capitalisation mean results using the conventional operating lease capitalisation model, the latter of which is compared to the new proposed accounting treatment capitalisation mean results.

Table 4M: Impact of constructive capitalisation of operating leases and new proposed accounting treatment for Type A and Type B leases on financial statement ratios – descriptive statistics (n = 48)

Financial Ratio	Mean Pre-capitalisation (reported figures)	Mean Post-capitalisation (conventional OL capitalisation)	Mean Post-capitalisation (Type A & Type B capitalisation)	Mean Absolute Change+ (Sign.)^	Mean Relative Change+ (Sign.)^	*t*-Test* *p*-value+	Spearman Rank Correlation Coefficient+
Debt ratio	51.3%	57.8%	56.8%	-1.0%(1)	-1.5%(1)	0.000	0.997
Debt-to-equity (book value)	138.1%	212.8%	175.2%	-37.6%	-5.4%	0.126	0.997
Debt-to-equity (market value)	79.4%	92.5%	92.4%	-0.0%	0.2%	0.856	0.999
Times interest earned#	111.2	8.0	33.8	26.2(5)	-322.4%(5)	0.028	0.863
Current ratio	1.73	1.48	1.48	0.00	0.0%	N/A	1.000
EBITDA margin	15.8%	18.6%	16.0%	-2.6%(1)	-16.5%(1)	0.000	0.963
EBIT margin	11.8%	12.4%	11.9%	-0.6%(1)	-16.8%(1)	0.000	0.994
NPAT (net profit) margin	7.3%	7.2%	7.3%	0.1%	3.7%	0.112	0.985
Return on assets	10.9%	10.2%	9.4%	-0.8%(1)	-23.1%(1)	0.000	0.987
Return on capital employed	17.1%	15.6%	14.1%	-1.6%(1)	-24.0%(1)	0.000	0.982
Return on equity	20.9%	22.8%	20.9%	-1.8%(5)	-3.1%(5)	0.016	0.988
Asset turnover	1.75	1.52	1.48	-0.04(1)	-1.9%(1)	0.000	0.999
Earnings yield	8.1%	7.9%	8.0%	0.1%	3.7%	0.278	0.978
Price-earnings	18.62	19.56	18.72	-0.84	-2.2%	0.146	0.975
Market-to-book	3.38	4.00	3.38	-0.62(5)	-5.8%(5)	0.031	0.993

\+ Mean change, *t*-test and Spearman rank statistics were calculated comparing column 3 (conventional capitalisation) and column 4 (new proposed accounting treatment).

^ Figures in parenthesis next to mean absolute and relative ratio changes indicate statistical significance of a two-tailed, paired *t*-test ([1] = significant at 1% level; [5] = significant at 5% level; [10] = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

* Statistical significance examined using a two-tailed, paired *t*-test.

\# The pre-capitalisation mean of the times interest earned ratio excludes two companies (both General Retailers) that did not have any interest expense pre-capitalisation (i.e. n = 46). The remaining times interest earned ratio statistics exclude one company (a General Retailer) that did not have any interest expense post-capitalisation in terms of the new proposed accounting treatment as it only had operating leases relating to property (i.e. n = 47).

Table 4N: Impact of constructive capitalisation of operating leases and new proposed accounting treatment for Type A and Type B leases on Altman's failure prediction models – descriptive statistics (n = 48)

Z-score variable	Mean Pre-capitalisation (reported figures)	Mean Post-capitalisation (conventional OL capitalisation)	Mean Post-capitalisation (Type A & Type B capitalisation)	Mean Absolute Change+ (Sign.)^	Mean Relative Change+ (Sign.)^	*t*-Test* *p*-value+	Spearman Rank Correlation Coefficient+
Z/Z""-score - X_1	0.14	0.09	0.09	-0.00	0.0%	0.147	1.000
Z/Z"-score - X_2	0.39	0.33	0.34	0.01$^{(1)}$	8.8%$^{(1)}$	0.000	0.996
Z/Z""-score - X_3	0.14	0.13	0.12	-0.01$^{(1)}$	-18.2%$^{(1)}$	0.000	0.988
Z-score - X_4	4.32	2.97	2.95	-0.01$^{(5)}$	-0.2%$^{(5)}$	0.010	0.999
Z-score - X_5	1.64	1.43	1.39	-0.03$^{(1)}$	-1.9%$^{(1)}$	0.000	0.999
Z-score (Z)	5.42	4.22	4.16	-0.06$^{(1)}$	-1.4%$^{(1)}$	0.000	0.999
Revised Z"-score - X_4	1.41	1.04	1.07	0.02$^{(1)}$	8.2%$^{(1)}$	0.000	0.997
Revised Z"-score (Z")	4.65	3.69	3.67	-0.02$^{(10)}$	1.6%$^{(10)}$	0.084	0.998

\+ Mean change, *t*-test and Spearman rank statistics were calculated comparing column 3 (conventional capitalisation) and column 4 (new proposed accounting treatment).

^ Figures in parenthesis next to mean absolute and relative variable changes indicate statistical significance of a two-tailed, paired *t*-test (^{1} = significant at 1% level; ^{5} = significant at 5% level; ^{10} = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

* Statistical significance examined using a two-tailed, paired *t*-test.

The results in Table 4M clearly indicate that there is generally not a substantial difference in the financial statement ratios calculated when comparing the results of the conventional operating lease capitalisation model to capitalisation in terms of the new proposed lease accounting treatment. The Spearman rank correlation coefficients calculated also indicate the ranking of companies for each ratio is also very much the same regardless of which capitalisation method is used. However, the following three notable differences in Table 4M are highlighted:

i. The debt-to-equity ratio based on book values shows an absolute decrease in the calculated means of 37.6 percentage points. This is attributable to the fact that there is no equity adjustment when capitalising Type B leases under the new proposed accounting treatment, whereas there is a debit (decrease) to equity (retained earnings) in terms of the conventional operating lease capitalisation model due to a

lower leased asset recognised in comparison to the associated lease liability recognised.

ii. The mean of the times interest earned ratio increases substantially by 26.2 times (significant at the 5% level), mainly due to the fact that a single operating lease expense is recognised for Type B leases as opposed to interest expense arising from the lease liability and an amortisation charge relating to the leased asset under the conventional operating lease capitalisation model.

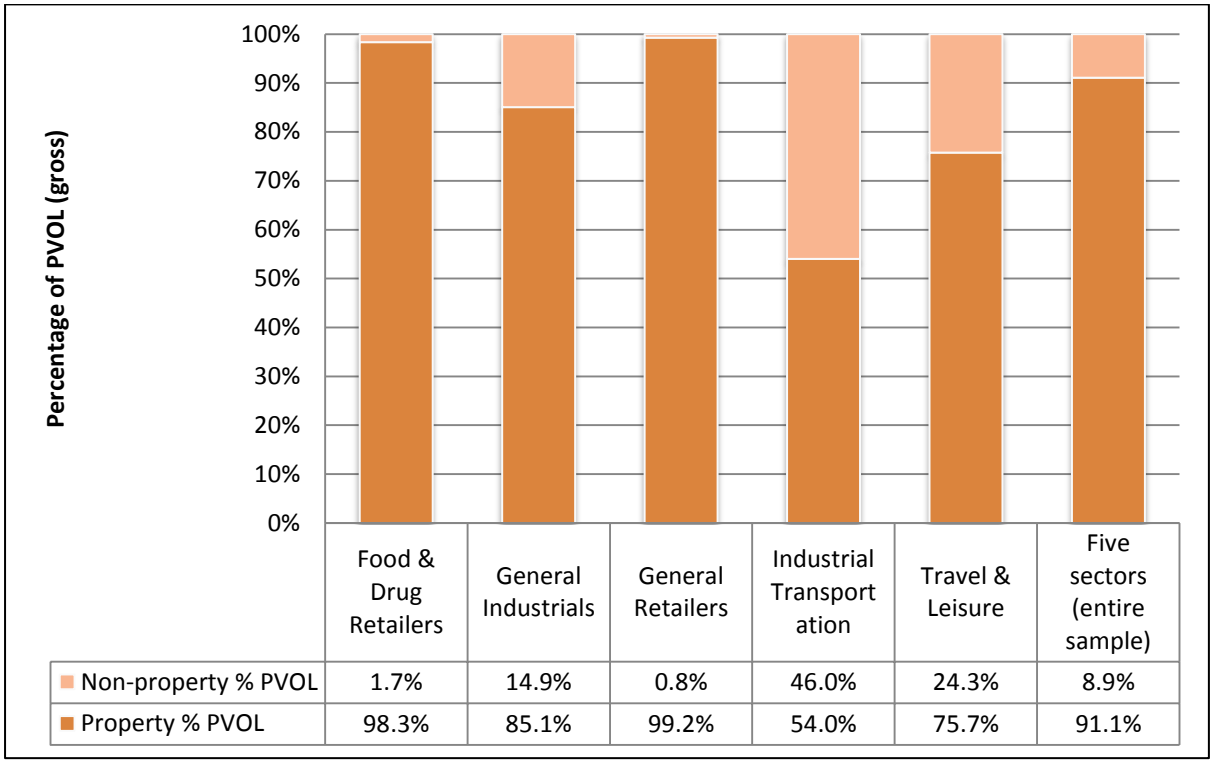
iii. The mean profitability ratios, other than return on assets and return on capital employed, that arise under the new proposed lease accounting treatment are very much in line with the mean ratios calculated using reported figures (pre-capitalisation). This is due to the income statement impact of Type B leases being principally the same as the current accounting treatment for operating leases in terms of IAS 17. This is not the case for the return on assets and return on capital employed ratios as a leased asset is recognised for Type B leases which is greater than the asset recognised through conventional operating lease capitalisation – this is confirmed by these ratios being lower under the proposed new accounting treatment than both the current accounting treatment (pre-capitalisation) as well as conventional operating lease capitalisation. This latter point is also the reason for the asset turnover ratio decreasing to 1.48 when applying the new proposed accounting treatment.

The impact of the new proposed accounting treatment of operating leases on Altman's failure prediction models produces very similar results to operating lease capitalisation in terms of the conventional capitalisation model as indicated in Table 4N. Despite this, both the mean Z-score as well as the mean Z''-score are slightly lower in terms of the new proposed accounting treatment than the conventional operating lease capitalisation model, although only by a small margin.

The preceding analyses suggest that a substantial number of operating lease agreements for companies within the sample relate to property (classified as Type B leases) as opposed to non-property assets (classified as Type A leases). This is due to the differences in the mean ratios noted in Table 4M and the fact that Type A leases (non-property) are capitalised in accordance with the conventional lease capitalisation model under the new proposed accounting rules and should therefore produce the same results, while the opposite is true for Type B leases (property). Graph 4C confirms this as the proportion of the present value of future operating lease payments (PVOL) relating to property for the entire sample (all five sectors) was 91.1%, with the remaining 8.9% relating to non-property leases. Retailers clearly have the largest and a substantial proportion of operating lease liabilities relating to

property, with 98.3% for Food & Drug Retailers and 99.2% for General Retailers. For the other sectors this proportion was between 54.0% and 85.1%. In summary, all these future lease payments relating to property will be accounted for as Type B leases in terms of the new proposed lease accounting rules which differs from the conventional operating lease capitalisation method resulting in the differences noted in Table 4M and Table 4N.

Graph 4C: Property and non-property split of the gross present value of future operating lease payments (PVOL) – by sector



	Food & Drug Retailers	General Industrials	General Retailers	Industrial Transportation	Travel & Leisure	Five sectors (entire sample)
Non-property % PVOL	1.7%	14.9%	0.8%	46.0%	24.3%	8.9%
Property % PVOL	98.3%	85.1%	99.2%	54.0%	75.7%	91.1%

Therefore, considering the sample of companies within the five sectors analysed in this section, the new proposed accounting treatment for Type A and Type B leases has substantially the same impact on key financial statement ratios and Altman"s failure prediction models as the conventional operating lease capitalisation method, except for the following ratios: debt-to-equity (based on book values), times interest earned, return on assets and return on capital employed. The financial statement ratio and failure prediction model results would be exactly the same if it was not for the new proposed accounting treatment of Type B leases and a substantial portion of future operating lease payments were found to relate to property (Type B leases) resulting in the differences noted.

4.3.3. Results of Research Question 3

Research Question 3: *Are operating leases used extensively and substantially more than finance leases in South Africa?*

Of the 48 companies analysed, it was found that 23 companies (47.9%) had recognised liabilities in respect of finance leases while all 48 companies (100%) had entered into operating leases based on the disclosure of future minimum lease payments due under non-cancellable operating leases. Table 4O presents an analysis thereof by sector – this indicates that a far greater proportion of industrial companies (General Industrials and Industrial Transportation) make use of finance leases than companies within the retail and travel and leisure sectors. This is likely a consequence of industrial companies entering into more lease agreements for non-property assets such as equipment and vehicles than companies within the retail and travel and leisure sectors (confirmed in Graph 4C). The lease of equipment has a good chance of being classified and accounted for as a finance lease as opposed to an operating lease due to non-property assets generally having a shorter economic life than property. The opposite is true for retailers and companies within the travel and leisure sector that rent operating premises which will most likely be classified as an operating lease due to the longer economic life of such assets.

Table 4O: Finance and operating lease usage analysis – by sector

Sector	Companies Investigated	Companies with Recognised Finance Leases	Companies with Operating Lease Disclosures
Food & Drug Retailers	4	1 (25.0%)	4 (100%)
General Industrials	11	7 (63.6%)	11 (100%)
General Retailers	17	7 (41.2%)	17 (100%)
Industrial Transportation	7	5 (71.4%)	7 (100%)
Travel & Leisure	9	3 (33.3%)	9 (100%)
Five sectors (entire sample)	48	23 (47.9%)	48 (100%)

Note: The figures presented in parentheses indicate the proportion of companies within each sector that have entered into finance leases (column 3) and operating leases (column 4).

When further analysing the extent of finance lease usage as a source of debt finance one company was excluded, namely Super Group Limited (SPG), as the company"s annual financial statements did not disclose the value of the finance lease liabilities due to this number being aggregated with other recognised liabilities. For the remaining 22 companies with finance leases it was found that the value of recognised finance leases comprised 4.6% of total recognised debt (current and non-current liabilities), on average, and the standard deviation thereof was 12.4%. For two companies this percentage was 21.6% (General Retailer) and 56.3% (Industrial Transportation); therefore when excluding these two outliers the mean percentage comes down to 1.2% with a standard deviation of 1.5% for the remaining 20 companies. In summary, these results indicate that of the 47 companies analysed, 25 companies (53.2%) do not make use of finance leases, 20 companies (42.6%) make minimal use of finance leases as a source of finance and only two companies (4.3%) make substantial use of finance leases in relation to total reported debt.

As noted in section 4.3.1, the analysis relating to operating lease usage as a source of finance off-balance sheet revealed that, for the 48 companies which used operating leases, the present value of unrecognised operating lease liabilities (after taking into account recognised straight-lining and onerous contract provisions relating to operating leases already recognised) was 33.7% of total recognised debt, on average with a standard deviation of 44.5%. Operating lease usage is therefore far greater than finance lease usage. This conclusion is also evident from the results presented in Table 4P which indicates the magnitude of lease usage based on an analysis of the value of recognised finance lease liabilities (RFL) and constructively capitalised operating lease liabilities (PVOL) in relation to total recognised debt as well as each other. Furthermore, it indicates that operating lease usage is far more prevalent than finance lease usage with the gross present value of operating lease liabilities being 25.9 times that of the present value of finance lease liabilities reported when aggregating all the data for the sample of 47 companies. Notably, within the Food & Drug Retailers sector total operating lease liabilities are 210.5 times the size of finance lease liabilities.

Therefore, considering the sample of companies within the five sectors analysed in this section, operating leases are used extensively and substantially more than finance leases within South Africa. The results presented in this section support evidence presented by Durocher (2008, p. 230) suggesting that companies prefer classifying lease agreements as operating leases as opposed to finance leases as they are then not capitalised and remain off-balance sheet. Furthermore, the results for the sample of South African companies analysed in this research study are in line with findings by the SEC (SEC, 2005, p. 64) which

found that operating leases were used extensively and substantially more by US companies (28 times more based on an analysis of undiscounted cash flows committed under leases).

Table 4P: Finance and operating lease usage comparative analysis – by sector

Sector	*n*	RFL % Total Debt	PVOL (unrecognised) % Total Debt	PVOL (gross) % RFL
Food & Drug Retailers	4	0.2%	46.4%	21,045%
General Industrials	11	0.7%	8.0%	1,110%
General Retailers	17	1.8%	44.5%	2,676%
Industrial Transportation	7*	0.7%	9.4%	1,341%
Travel & Leisure	9	0.6%	10.4%	2,240%
Five sectors (entire sample)	48*	0.8%	20.2%	2,585%

* The entire sample of 48 companies for all five sectors and 7 companies for the Industrial Transportation sector were included when analysing operating leases in column 4; however, Super Group Limited (SPG) was excluded for the remaining analysis in column 3 and column 5 incorporating finance leases as the value of recognised finance lease liabilities was not seperately disclosed.

Notes:

1. RFL = recognised finance leases.
2. PVOL = present value of operating leases (constructively capitalised). PVOL (unrecognised) is the unrecognised portion thereof after taking into account any straight-lining and onerous contract provisions relating to operating leases already recognised and is used in column 4 as it indicates the extent of off-balance sheet operating lease finance. PVOL (gross) is the total present value of future minimum operating lease payments due before taking into account any straight-lining and onerous contract provisions relating to operating leases already recognised and is used in column 5 as it compares the aggregate of debt relating to operating leases to the aggregate of debt relating to finance leases.
3. Total Debt = current plus non-current liabilities already recognised i.e. ignoring the constuctive capitalisation of operating leases.

4.3.4. Results of Research Question 4

Research Question 4: *Does the size of a company have an impact on the extent of lease (finance and operating) utilisation?*

In line with Sharpe and Nguyen (1995, p. 280) and Adams and Hardwick (1998, p. 491) the size of a company was determined by revenue rather than the asset base of companies within the sample. Their justification included the fact that using assets as a proxy for size could lead to endogeneity (due to entities that lease more through operating leases having less assets) as well as the fact that it could lead to simultaneous equation bias. However, the first mentioned reason is not applicable in this research study as operating leases have been capitalised using the constructive operating lease capitalisation model developed in section 3.3 and hence a leased asset has been recognised. A more pertinent reason for using sales in this study is to avoid sector bias as different sectors require differing levels of investment in fixed assets to operate successfully, most notably when comparing all companies (five sectors) within the sample. A test was performed through calculating the Spearman rank correlation coefficient for the entire sample comparing revenue to total assets (including capitalised operating leases) in order to determine if the rankings between the two are similar or drastically different. The Spearman rank correlation coefficient was 0.916 indicating a strong positive relationship between the ranking by revenue and the ranking by total assets thus providing comfort that either could be used as a proxy for company size. Nonetheless, based on the previous justification, revenue was used as the proxy for company size in the analysis that follows.

Furthermore, in line with Adams and Hardwick (1998, p. 491) and Callimaci et al. (2011, p. 269), the natural logarithm (ln) of revenue was used as a proxy for size in order to moderate asymmetry in the data set when performing regression analysis.

The size of companies within the selected sample, in total and by sector, was then compared to three leasing measures, namely: 1) the *extent of leasing using operating leases* measured as total operating lease liabilities divided by total fixed assets; 2) the *extent of leasing using finance lease leases* measured as total finance lease liabilities divided by total fixed assets; and 3) the *extent of total leasing* measured as the sum of operating and finance lease liabilities divided by total fixed assets. In the preceding leasing measures total fixed assets is defined as total assets (as disclosed before operating lease capitalisation) *plus* operating leased assets determined by the operating lease capitalisation model *less* current assets which are unchanged when capitalising operating leases. The use of this adjusted measure of total fixed assets is considered the best measure by which to gauge the extent of leasing as it indicates the level to which fixed assets utilised by a company are funded

through both finance and operating leases. It is noted that the operating lease liability and the operating leased asset do not equal each other (as explained in section 2.2.1); however, that does not negate using this adjusted measure of total fixed assets as the denominator to gauge the extent of lease usage in relation to the size of the company.

Each of the three leasing measures were then statistically analysed and compared to the size of the company through calculating the Pearson correlation coefficient (*r*) and performing simple linear regression analysis. The regression analysis was performed using company size (the natural logarithm of sales) as the independent variable (*x*) and the extent of leasing as the dependent variable (*y*) as indicated below:

$$y = ax + b$$

Where, y = *extent of leasing*

a = *coefficient variable (slope of the straight line)*

x = *size of the company (natural logarithm of sales)*

b = *constant intercept*

Furthermore, the coefficient of determination (R^2) was also calculated as an indicator of the goodness of fit of the regression line in addition to other statistics, such a two tailed *t*-test to gauge the significance of the coefficient variable (*a*) calculated in the regression equation. Table 4Q presents a summary of the pertinent correlation and regression statistics calculated across the five sectors as well as for the entire sample. The results indicate that overall for all five sectors there is a positive relationship between the size of a company and its propensity to lease assets using operating leases as opposed to buying the asset (i.e. the bigger a company is, the greater percentage of total fixed assets are leased using operating leases). However, the opposite was found for finance leases where lease usage decreased as size increased. Similar mixed results were found when considering the five sectors. Furthermore, very few of the coefficient variables (*a*) calculated were found to be statistically significant and only operating lease usage and total lease usage within the Travel & Leisure sector proved to have a R^2 value of greater than 50%. This is acceptable as prior research studies (for example Sharpe and Nguyen (1995), Lasfer and Levis (1998), Adams and Hardwick (1998) and Callimaci et al. (2011)) found that many other variables, such as tax position, leverage, growth prospects and ownership concentration, impact on the extent of lease usage, none of which are considered in this research study. Furthermore, the relationship between the size of a company and the extent of leasing is the pertinent aspect

relevant to answering this research question which is indicated by the signs of the Pearson correlation coefficient (*r*) and the coefficient variable (*a*) rather than the significance thereof.

Table 4Q: Statistical analysis of the extent of lease usage in relation to the size of companies across various sectors

Sector	*n*	Operating Lease Liability *percentage of* Total Fixed Assets			Finance Lease Liability *percentage of* Total Fixed Assets			Sum of Operating Lease and Finance Lease Liabilities *percentage of* Total Fixed Assets		
		r	*a*^	R^2	*r*	*a*^	R^2	*r*	*a*^	R^2
Food & Drug Retailers	4	-0.155	-0.027	0.024	0.265	0.002	0.070	-0.142	-0.026	0.020
General Industrials	11	0.384	0.012	0.147	0.456	0.003	0.208	0.448	0.015	0.201
General Retailers	17	0.496	0.065(5)	0.246	0.122	0.008	0.015	0.453	0.07(10)	0.206
Industrial Transportation	7*	-0.062	-0.005	0.004	-0.563	-0.051	0.317	-0.570	-0.055	0.325
Travel & Leisure	9	-0.762	-0.07(5)	0.581	0.512	0.001	0.262	-0.761	-0.07(5)	0.578
Five sectors (entire sample)	48*	0.226	0.030	0.050	-0.047	-0.003	0.002	0.190	0.028	0.036

^ Figures in parenthesis next to the coefficient variable (*a*) indicate statistical significance of a two-tailed, paired *t*-test ([1] = significant at 1% level; [5] = significant at 5% level; [10] = significant at 10% level). Absence thereof indicates that the figure is statistically insignificant considering the three significance levels.

* The entire sample of 48 companies for all five sectors and 7 companies for the Industrial Transportation sector were included when analysing operating leases; however, Super Group Limited (SPG) was excluded for the remaining analysis incorporating finance leases as the value of recognised finance lease liabilities was not seperately disclosed.

However, despite the positive and negative associations noted in the preceding results, in prior research studies by Adams and Hardwick (1998) and Koh and Jang (2009) a curvilinear relationship was noted when considering an entity"s size in relation to its leasing propensity. Therefore the sample was divided into three stratums (small, medium and large companies), both in aggregate and by sector, based on the size of the company considering the $33^1/_3{}^{rd}$ and the $66^2/_3{}^{rd}$ percentiles for revenue (proxy for size) of the sample. Once these revenue percentiles were established, all companies were divided into three groups as follows:

- Small company – revenue less than the $33^1/_3{}^{rd}$ percentile
- Medium (Med) company – revenue greater than the $33^1/_3{}^{rd}$ percentile but less than the $66^2/_3{}^{rd}$ percentile
- Large company – revenue greater than the $66^2/_3{}^{rd}$ percentile

Thereafter the three aforementioned leasing measures indicated in Table 4Q were calculated for each of these groups. A comparison of these leasing measures in Table 4R for each group clearly indicates that curvilinear relationships are evident. When considering all five sectors (the entire sample) then for operating leases the propensity to lease decreases slightly when moving from small companies to medium-sized companies; however, it increases by 15.0 percentage points when moving from medium-sized to large companies. For finance leases the opposite curvilinear relationship exists within the sample tested.

Furthermore, all three leasing measures within the Food & Drug Retailers sector initially increased and then decreased, while the same was evident for finance lease usage of General Retailers. In comparison, all leasing measures within the Industrial Transportation sector initially decreased when moving from small companies to medium-sized companies but then increased, while the same was found for operating and total lease usage within the General Industrials sector.

Table 4R: Analysis of the extent of lease usage in relation to the size of companies across various sectors

Sector	*n*	Operating Lease Liability *percentage of* Total Fixed Assets			Finance Lease Liability *percentage of* Total Fixed Assets			Sum of Operating Lease and Finance Lease Liabilities *percentage of* Total Fixed Assets		
		Small	Med	Large	Small	Med	Large	Small	Med	Large
Food & Drug Retailers	4	55.0% (1)	66.3% (2)	41.8% (1)	0.0% (1)	0.4% (2)	0.0% (1)	55.0% (1)	66.8% (2)	41.8% (1)
General Industrials	11	5.7% (4)	4.6% (3)	7.3% (4)	0.0% (4)	0.4% (3)	1.1% (4)	5.7% (4)	4.9% (3)	8.4% (4)
General Retailers	17	30.4% (6)	33.3% (5)	56.2% (6)	1.4% (6)	11.0% (5)	0.8% (6)	31.8% (6)	44.3% (5)	57.0% (6)
Industrial Transportation	7*	21.7% (2)	8.5% (3)	14.4% (2)	20.5% (2)	0.0% (2*)	0.6% (2)	42.3% (2)	6.8% (2*)	15.0% (2)
Travel & Leisure	9	24.3% (3)	20.7% (3)	10.5% (3)	0.0% (3)	0.2% (3)	0.3% (3)	24.3% (3)	20.8% (3)	10.8% (3)
Five sectors (entire sample)	48*	21.6% (16)	20.6% (16)	35.6% (16)	3.1% (16)	3.8% (15*)	0.7% (16)	24.7% (16)	25.1% (15*)	36.3% (16)

Note: Figures in parentheses below the calculated percentage indicate the number of companies included in the relevant size category calculation.

* This category includes Super Group Limited (SPG), a medium-sized Industrial Transportation company, which was excluded for the finance leases analyses as the value of recognised finance lease liabilities was not seperately disclosed.

Therefore, considering the sample of companies within the five sectors analysed in this section, it was found that there were both positive and negative relationships between the size of a company and its propensity to lease assets. Most notably, when considering all companies, operating lease usage increased as company size increased, while finance lease usage decreased as company size increased. This is contrary to the results of the prior research studies mentioned in section 2.4.1 (see for example Callimaci et al. (2011) and Cornaggia et al. (2013)), where it was found that operating lease usage decreased while finance lease usage increased as the size of the entity increased. The results of this research study therefore appear to be a unique situation for the sample of South African companies analysed for which the reason is unknown. Furthermore, the presence of curvilinear relationships were noted when comparing company size and the extent of leasing, most notably that the operating lease usage for the entire sample initially decreased and then increased with company size. The same was true for most of the lease usage within the industrial sectors (General Industrials and Industrial Transportation). Similar curvilinear relationships were identified by Adams and Hardwick (1998) as well as Koh and Jang (2009). However, an opposite curvilinear relationship was noted for finance lease usage for the entire sample as well as for the majority of lease usage amongst retailers (Food & Drug Retailers and General Retailers) where lease usage initially increased and then decreased with company size. This also appears to be a unique discovery which may be particular to the South African companies analysed. In summary, the extent of lease usage is therefore impacted by the size of the company but the relationship differs between sectors and the type of lease, and is often curvilinear in nature.

4.3.5. Analysis of Ancillary Issues

Two ancillary issues covered by this research study are analysed in the two sub-sections that follow, namely an analysis of whether the recognised straight-lining and onerous contract provisions relating to operating leases are material or not (in section 4.3.5.1) and whether any disclosed loan covenants are breached after capitalising operating leases (in 4.3.5.2.)

4.3.5.1. Straight-lining and Onerous Contract Provisions

Through the literature reviewed it was established that two accounting provisions relating to operating leases, namely straight-lining provisions and onerous operating lease contract provisions, have previously been ignored in research relating to the capitalisation of operating leases. Although these provisions, discussed in section 2.3.1.1, were incorporated

into the operating lease capitalisation model developed, this section analyses whether these provisions that have already been recognised and separately disclosed in respect of operating lease liabilities are in fact sizable or rather immaterial amounts. It is to be noted that immaterial provisions would not be disclosed by companies and provisions may also be aggregated when disclosed, hence any such straight-lining or onerous contract provisions would not be identified and included in this research study. Although this is noted as a limitation of this study, it is assumed that all material provisions were separately disclosed by companies within the selected sample.

Firstly, the results in Table 4S indicate that straight-lining provisions are far more prevalent, both in aggregate and across all five sectors analysed than onerous contract provisions. This is expected for the following two reasons: 1) most operating leases are likely to include escalation clauses (increasing future minimum lease payments) in order to, at a minimum, protect the lessor against inflation over the lease term; and 2) onerous operating lease contract provisions are only recognised when the future expected minimum lease payments (cash outflows) exceed the future expected economic benefits (cash inflows) that likely to flow to an entity as a consequence of the lease – this should only occur occasionally.

Table 4S: Prevalence of straight-lining and onerous contract provisions relating to operating leases – by sector

Sector	Companies Investigated	Companies with Straight-lining Provisions	Companies with Onerous Contract Provisions
Food & Drug Retailers	4	4 (100%)	2 (50%)
General Industrials	11	3 (27.3%)	1 (9.1%)
General Retailers	17	13 (76.5%)	5 (29.4%)
Industrial Transportation	7	3 (42.9%)	1 (14.3%)
Travel & Leisure	9	8 (88.9%)	0 (0%)
Five sectors (entire sample)	48	31 (64.6%)	9 (18.8%)

Note: The figures presented in parentheses indicate the proportion of companies within each sector that have straight-lining provisions (column 3) and onerous contract provisions (column 4).

Furthermore, it was found that retailers (Food & Drug Retailers and General Retailers) as well as companies within the Travel & Leisure sector had the highest percentage of companies with recognised straight-lining provisions. The likely reason for this is the fact that these companies rent more property than industrial companies (General Industrials and Industrial Transportation), which rent a greater percentage non-property assets (indicated in Graph 4C), and property leases are generally for a longer period with a greater chance of escalating minimum lease payments. The same is also true for retailers with respect to onerous contract provisions arising from operating leases. All companies with recognised provisions in respect of onerous operating lease contracts were also found to have recognised straight-lining provisions.

Secondly, for those companies with recognised and separately disclosed straight-lining provisions (31) and onerous contract provisions (9), descriptive statistics were calculated based on these provisions as a percentage of the gross operating lease liabilities (PVOL) calculated when constructively capitalising future minimum operating lease payments. The results are presented in Table 4T and indicate that onerous contracts are fairly immaterial; however, the largest percentage was 5.2% while the second largest was 2.2%. These are both noteworthy percentages of the operating lease liabilities which are already recognised (on-balance sheet) in respect of onerous contracts – although this admittedly only relates to a small minority of two companies within the entire sample of 48 companies (4.2%). On the other hand, this percentage substantially increases for straight-lining provisions relating to operating leases with a mean of 9.4%, a quarter of companies with a percentage of greater than 10.7% and a maximum percentage of 37.2%. This clearly indicates that straight-lining provisions are fairly material and an item that should be considered as ignoring them in relevant analyses could result in incorrect calculations and conclusions drawn regarding unrecognised operating lease liabilities as these straight-lining provisions, together with onerous contract provisions previously discussed, are already a portion of operating lease liabilities that have been recognised.

Finally, similar information has been calculated by sector and is presented in Table 4U. In line with the sectors that had the most companies with straight-lining provisions recognised (refer Table 4S) and for the same reasons, Food & Drug Retailers, General Retailers and companies within the Travel & Leisure sector have the greatest mean percentage of recognised straight-lining provisions divided by the gross present value of operating lease liabilities (PVOL). Contrary thereto, a company within the General Industrials sector had the highest percentage of recognised onerous contract provisions relating to operating leases divided by PVOL.

Table 4T: **Straight-lining and onerous contract provisions proportion of total present value of operating lease liabilities (PVOL) – descriptive statistics**

Descriptive Statistic	Straight-lining Provision *percentage of* PVOL (gross) (n = 31)	Onerous Contract Provision *percentage of* PVOL (gross) (n = 9)
Minimum	0.6%	0.1%
1st Quartile	5.3%	0.4%
Median (2nd Quartile)	8.1%	0.5%
3rd Quartile	10.7%	0.6%
Maximum (4th Quartile)	37.2%	5.2%
Mean	9.4%	1.1%
Standard deviation	7.4%	1.7%

Table 4U: **Straight-lining and onerous contract provisions proportion of total present value of operating lease liabilities (PVOL) – descriptive statistics by sector**

	Straight-lining Provision *percentage of* PVOL (gross)					Onerous Contract Provision *percentage of* PVOL (gross)				
Sector	*n*	Ave	Std dev	Med	Max	*n*	Ave	Std dev	Med	Max
Food & Drug Retailers	4	9.1%	2.0%	9.1%	11.2%	2	0.6%	0.1%	0.6%	0.6%
General Industrials	3	4.0%	1.6%	3.4%	5.9%	1	5.2%	0%	5.2%	5.2%
General Retailers	13	8.7%	5.1%	8.3%	21.0%	5	0.7%	0.9%	0.4%	2.2%
Industrial Transportation	3	5.5%	4.4%	6.9%	8.9%	1	0.4%	0%	0.4%	0.4%
Travel & Leisure	8	14.0%	11.6%	11.8%	37.2%	0	n/a	n/a	n/a	n/a
Five sectors (entire sample)	31	9.4%	7.4%	8.1%	37.2%	9	1.1%	1.7%	0.5%	5.2%

Notes:

1. Ave = average (mean)
2. Std dev = standard deviation
3. Med = median
4. Max = maximum

While reviewing the annual financial statements of the companies within the sample and collecting relevant data, it was noted that six of the 31 companies (19.4%) that had recognised provisions in respect of straight-lining provisions, provided additional voluntary disclosure in their operating lease commitments note whereby the straight-lining provisions already recognised were deducted from the disclosed future minimum lease payments. This indicates an understanding by financial statement preparers that recognised straight-lining provisions are a portion of the present value of their disclosed future minimum operating lease payments which have already been recognised. An example of this disclosure is provided below:

Future minimum lease payments under non-cancellable operating leases are as follows:	
Cash flow due in one year	*xxx*
Cash flow due after one year but within five years	*xxx*
Cash flow due after five years	*xxx*
Total future cash flows due	*xxx*
Less: Straight-lining provision already recognised as liability	*(xxx)*
Future operating lease expense	*xxx*

However, one of the six companies that provided the above disclosure also had a recognised provision in respect of onerous operating lease contracts which was contradictorily not disclosed as a deduction in the same way as the straight-lining provision.

In summary, straight-lining provisions are substantially more material than onerous contract provisions when compared to the total present value of operating lease liabilities that should be recognised and are capable of distorting the analysis of operating lease capitalisation if ignored. These provisions are also more prevalent and material amongst retailers and within the Travel & Leisure sector when compared to industrial companies.

4.3.5.2. Loan Covenants

While reviewing the annual financial statements of the companies within the selected sample, information pertaining to loan covenants was collected in order to determine if operating lease capitalisation results in the breach of any disclosed loan covenants. Although a number of companies stated within their annual financial statements that loan covenants were in place, only six of those companies provided details of their covenants – a summary thereof is presented in Table 4V. The results indicate that for all six companies the

capitalisation of operating leases negatively impacts the relevant ratio(s) associated with the loan covenant; however, none of the loan covenants are breached or come near to being breached when operating leases are constructively capitalised.

Table 4V: Impact of constructive capitalisation of operating leases on disclosed loan covenants

Company	Covenant Ratio Disclosed	Covenant Restriction Disclosed	Ratio Pre-capitalisation (reported figures)	Ratio Post-capitalisation of Operating Leases	Comment
Eqstra Holdings Limited (EQS)	Capital adequacy	Greater than 20%	24.62%	24.56%	Negative impact, inconsequential change
Imperial Holdings Limited (IPL)	Net debt to earnings before interest, taxation, depreciation and amortisation (EBITDA)	Below 3.5 : 1	1.2 : 1	1.5 : 1	Negative impact, inconsequential change
Super Group Limited (SPG)	Capital adequacy	Greater than 18%	27.1%	24.1%	Negative impact, inconsequential change
	Net interest cover	At least 2.7 times	22.2 times	15.1 times	Negative impact, inconsequential change
Sun International Limited (SUI)	Debt to EBITDA	Less than 3 times	2.2 times	2.3 times	Negative impact, inconsequential change
	EBITDA to interest	Greater than 3 times	6.5 times	6.1 times	Negative impact, inconsequential change
Taste Holdings Limited (TAS)	Debt-to-equity	Less than 100%	36.4%*	59.3%*	Negative impact, inconsequential change*

* The debt-to-equity ratio for Taste Holdings Limited (TAS) was not defined or disclosed in the company"s annual financial statements. The ratio was therefore calculated assuming debt equalled „short-term and long-term borrowings" plus „bank overdraft" i.e. excluding deferred taxation, trade payables etc.; however, if the ratio was calculated on the premise that debt equalled total non-current and current liabilities then the debt-to-equity ratio would change from 95.3% to 118.7% when capitalising operating leases resulting in a breach of the stated 100% maximum per the loan covenant.

This is a limited analysis and should not be assumed to be the case for all companies due to various reasons, including the following: 1) details of loan covenants are voluntary disclosures made by a select few companies (in this instance six of 48 companies within the sample i.e. 12.5%); and 2) it is more likely that companies that are safely within their covenant restrictions will disclose details thereof in order to promote a positive public image as opposed to companies that are closer to breaching their loan covenants.

Although none of the stated loan covenants for the six companies in Table 4V were breached as a result of capitalising operating leases, this analysis nonetheless confirms that operating lease capitalisation negatively impacts all covenant related ratios due to the recognition of an operating lease liability and interest thereon.

4.4. Conclusion

The research results and analysis presented in this chapter confirm that the constructive capitalisation of future non-cancellable operating lease commitments has a significant impact on both key financial statement ratios and Altman"s failure prediction models for the sample of South African companies (five sectors) analysed, most notably leverage and other debt-related ratios with retailers being the most affected. Furthermore, it was established that the new proposed accounting treatment for leases has substantially the same impact on key financial statement ratios and Altman"s failure prediction models as the conventional operating lease capitalisation method, except for the debt-to-equity (based on book values), return on assets and return on capital employed ratios which are substantially lower and the times interest earned ratio which is substantially higher for the reasons noted in section 4.3.2.

This research study also provides evidence that operating leases are used substantially more than finance leases by South African companies which is in line with the results of prior research studies conducted in other countries. Furthermore, operating lease usage is more prevalent amongst retailers and companies operating within the Travel & Leisure sector as opposed to industrial companies.

When analysing the size of the selected companies it was established that, contrary to the results of other similar research studies conducted in other countries, operating lease usage increased while finance lease usage decreased as company size increased. Furthermore, curvilinear relationships were also identified; however, for finance leases a curvilinear relationship was noted whereby lease usage initially increased and then decreased with company size which is also in contrast to previous research findings.

When analysing straight-lining and onerous operating lease contract provisions, it was found that straight-lining provisions are substantially more material than onerous contract provisions and they are more prevalent amongst retailers and companies operating within the Travel & Leisure sector as opposed to industrial companies. Straight-lining provisions relating to future operating lease payments are therefore capable of distorting operating lease capitalisation results if ignored. Further additional ancillary analysis found that for a small sample of companies that disclosed details of their loan covenants, none of the loan covenants were breached as a result of capitalising operating leases; however, operating lease capitalisation nonetheless negatively impacted all covenant related ratios.

While collecting the relevant data required for this research study the following extract was noted in one of the company"s annual financial statements, namely Massmart Holdings Limited (MSM):

> *"Whilst the Group does not provide comments on Exposure Drafts, ED 288 Exposure Draft of an Amendment to Statements of Generally Accepted Accounting Practice Leases issued in August 2010, remains an area of focus. This ED contains various proposals to improve the financial reporting of lease contracts. The accounting treatment under the existing standard IAS 17 Leases is determined by the classification of the lease. Classification as an operating lease results in the lessee not recording any assets or liabilities in the statement of financial position under IFRS. This results in many investors having to adjust the financial statements (using disclosures and other available information) to estimate the effects of lessees" operating leases for the purpose of investment analysis. The proposed ED would result in a consistent approach to lease accounting for both lessees and lessors – a „right-of-use" approach. Among other changes, this approach would result in the liability for payments arising under the lease contract and the right to use the underlying asset being included in the lessee"s statement of financial position, thus providing more complete and useful information to investors and other users of financial statements. As part of the transition, we would remove the „lease liability" that is currently accounted for in the statement of financial position resulting from SAICA Circular 07/2005: Operating Leases that required us to smooth operating leases. We anticipate the exposure draft becoming a standard in approximately two years. We are currently unable to estimate accurately the financial impact on the Group, although understood to be material, as the change proposed has raised some concerns in the financial community. Once these issues have been clarified, we will indicate the financial impact on the Group"s results."* (Massmart Holdings Limited, 2012)

Although the above statement refers to the exposure draft (ED/2010/9) released during 2010 which has been withdrawn, the same principles of capitalising the future minimum lease

payments of lessees under non-cancellable operating lease agreements and recognising a leased asset and lease liability apply in terms of the proposed accounting treatment of the revised exposure draft (ED/2013/6) released in 2013 and considered in this study. This statement is therefore relevant and apt to note in conclusion, as it clearly acknowledges three substantive issues already identified through the literature reviewed and analysis of results in this research study, namely: 1) the new proposed lease accounting rules will improve the financial reporting of leases through recognising a lease liability for all leases as well as an associated right-of-use asset; 2) a portion of the lease liability is already recognised through the current lease accounting requirement to straight-line lease payments due in terms of an operating lease agreement; and 3) the impact of the new proposed lease accounting rules to capitalise all lease agreements is expected to have a material impact on reported results. The latter two points were explicitly investigated and confirmed by the research results presented in this chapter.

Chapter 5: Summary

5.1. Overview

This study analysed the impact that operating lease capitalisation has on key financial statement ratios and failure prediction indicators of South African companies, as well as whether the impact thereof is substantially the same as the new proposed accounting treatment for leases (in terms of ED/2013/6 – the revised lease accounting exposure draft released by the IASB and FASB in May 2013). Furthermore, this research study examined the extent of lease usage in South Africa and whether the size of a company has a bearing on its extent of leasing. Additional analysis was also performed investigating the materiality of straight-lining and onerous contract provisions relating to operating leases. Finally, the impact of operating lease capitalisation on disclosed loan covenants was also examined.

Based predominantly on the ILW method of constructively capitalising operating leases developed by Imhoff et al. (1991 & 1997), a refined constructive lease capitalisation model was developed in this research study which incorporates aspects of current lease accounting rules not previously considered, namely provisions recognised in respect of the straight-lining of operating leases as well as onerous operating lease contracts. This model also incorporates the new proposed lease accounting rules which require the capitalisation of all leases, including those currently defined as operating leases and disclosed in the notes to the financial statements which are consequently off-balance sheet.

The lease capitalisation model was applied to a sample of South African JSE-listed companies selected from five sectors for which it was confirmed substantial use of leasing is made. It was found that the capitalisation of future non-cancellable operating lease commitments have a significant impact on key financial statement ratios and failure prediction indicators, most notably leverage and other debt-related ratios. Furthermore, of the five sectors analysed, retailers were the most affected. Despite these changes it was established that the ranking of companies in the sample, with respect to financial ratios as well as failure prediction indicators, did not change greatly when comparing their rankings before and after the capitalisation of operating leases. However, when considering Altman's failure prediction models (Z-score and Z''-score), the changes arising from capitalising operating leases resulted in a deterioration of the bankruptcy risk status for 22.9% of the companies within the sample based on the revised Z''''-score model which is purported to be more applicable to companies operating within an emerging economy such as South Africa (this occurred for 10.4% of the companies when considering the original Z-score model).

Considering the new proposed accounting treatment for Type A and Type B leases (in terms of ED/2013/6), the research findings presented in this paper indicate that operating lease capitalisation in terms of these new proposals has substantially the same impact on key financial statement ratios and Altman"s failure prediction models as the conventional operating lease capitalisation method. However, this was not the case for the debt-to-equity ratio (based on book values) which decreased, times interest earned which increased and the return on assets and return on capital employed ratios which decreased. These differences arise from the fact that a substantial portion of future operating lease payments were found to relate to property (i.e. property leases are classified as Type B leases which are treated similarly to current operating leases when considering the income statement impact thereof).

Further, the research findings found that every company within the sample made use of operating leases while just less than half of the companies had entered into material finance lease agreements. However, further proving that operating leases are used extensively and substantially more than finance leases within South Africa, it was found that for the entire sample the present value of operating lease liabilities was 25.9 times that of the reported present value of finance lease liabilities. This finding is in line with prior research results and is in all likelihood due to the off-balance sheet benefit of operating leases.

When considering the size of all companies included in the sample, it was found that the extent of lease usage is impacted by the size of the company. Notably, operating lease usage was found to be positively related to company size, while finance lease usage decreased as company size increased. Furthermore, the presence of curvilinear relationships were noted between a company"s size and its extent of leasing; most notably that, based on the entire sample, operating lease usage initially decreased and then increased with company size. However, an opposite curvilinear relationship was noted for finance lease usage.

Further analysis revealed that recognised straight-lining lease provisions are substantially more material than recognised onerous lease contract provisions and are capable of distorting the analysis of operating lease capitalisation if ignored. When scrutinising loan covenants disclosed by six companies within the sample, it was established that none of the loan covenants were breached when capitalising operating leases; however, in each instance operating lease capitalisation negatively impacted all covenant related ratios due to the recognition of an operating lease liability and interest thereon.

5.2. Limitations

A few important limitations were noted within this research paper; these, together with other limitations, are highlighted within this section.

Considering Altman"s failure prediction models, these were developed using statistical techniques based on accounting numbers that did not capitalise operating leases. If operating leases were capitalised and considered when developing the failure prediction models, Altman may have determined different coefficients, ratios and classification zones. Nonetheless, the analysis and results presented in this research study are relevant, providing valuable insight into the impact of operating lease capitalisation on failure prediction indicators. Furthermore, this study"s approach is consistent with other studies (see Jesswein (2009) and Cornaggia et al. (2013)) and detailed information on the revised ZETA® model, which incorporates an adjustment capitalising all non-cancellable leases, is not publically available for use in research studies.

The interest rate used to discount future minimum operating lease payments is noted as a limitation due to the difficulty in establishing an appropriate company-specific rate based on figures and related information disclosed within annual financial statements. Using a company-specific discount rate, where possible, is considered superior to using a blanket rate, which was necessary for only 13 companies (27.1% of the sample), as it differentiates between the varying risk profiles of the companies selected.

This research study focused on the capitalisation of operating leases and a comparison thereof to the new proposed accounting treatment for leases. In this respect, some finance leases currently recognised on a company"s balance sheet could be classified as Type B leases in terms of the new proposed accounting rules if they relate to the rental of property – the impact thereof was not considered in this research study. In such an instance only the leased asset value and retained earnings (equity) would increase, while the income statement would reflect a straight-line lease charge as opposed to amortisation and interest charges. Any such differences were assumed to be immaterial in this study as this is unlikely to be the case for a material proportion of finance lease liabilities due to most finance leases relating to the rental of non-property assets with a shorter economic life, such as equipment and vehicles, based on the current definition and rules relating to finance leases in terms of IAS 17.

Immaterial straight-lining and onerous lease contract provisions are not disclosed by companies and these provisions may also be aggregated when disclosed, hence any such straight-lining or onerous contract provisions would not have been identified and analysed in

this research study. Although this is a limitation, it was reasonably assumed that all material provisions were separately disclosed by companies within the selected sample.

Loan covenant disclosure by companies is voluntary, therefore the research results indicating that operating lease capitalisation does not result in a breach of loan covenants cannot be assumed to be the case for all companies with operating leases. This is further supported by the fact that it is more likely that companies that are safely within their covenant restrictions will disclose details thereof in order to promote a positive public image as opposed to companies that are closer to their loan covenant limits.

Finally, this research study only analysed companies listed within five sectors of the JSE and therefore the results cannot be extrapolated to all JSE-listed companies.

None of the aforementioned limitations adversely impact the research study to such an extent that the findings and conclusions drawn cannot be relied upon.

5.3. Further Research

A number of areas for further research relating to the capitalisation of operating leases which are closely aligned to or an extension of this research study have been identified and are discussed within this section.

Reasons for the differences in findings between this research study and those of de Villiers and Middelberg (2013), a research study that also focused on South African listed companies (specifically those listed on the JSE within the Top 40 index), can be explored.

Further investigation into the accuracy of Altman"s failure prediction models, incorporating the capitalisation of operating leases, can also be undertaken to determine whether the inclusion of capitalised operating leases results in an improved prediction of failure for South African companies over time.

The findings that operating lease usage increased as company size increased, while finance lease usage decreased as company size increased, can be further investigated as that was found to be contrary to the results of the prior research studies. The reasons for this unique situation, particular to the South African companies analysed in this study, can be investigated together with the reasons for the unique curvilinear relationship noted for finance lease usage where lease usage initially increased and then decreased with company size.

Furthermore, although size was found to have an impact on the extent of lease usage, an investigation can be undertaken into the other factors that impact the extent of lease usage

by South African companies. Other factors would likely include but are not limited to existing leverage, fixed capital investment, ownership structure, tax position and growth potential.

An inquiry into whether loan officers take operating leases into account can also be undertaken. This will provide insight into whether loan officers consider operating leases when determining a company"s financial risk, the extent of finance provided and associated lending terms and conditions, including the establishment of loan covenants.

Finally, the constructive lease capitalisation model developed and the analysis performed in this research study can be applied to all JSE-listed companies in order to determine the impact of operating lease capitalisation on other sectors as well as the aggregate of all South African listed companies. The extent of leasing within South Africa can then also be further analysed.

5.4. Conclusion

This research study has found that operating leases are used extensively and more than finance leases by South African companies to obtain the use of operating assets. Furthermore, financial statement ratios and failure prediction indicators change substantially and significantly when operating leases are capitalised, which is important to note in light of impending lease accounting changes advocating the capitalisation of all leases. Balance sheet related financial statement ratios were more affected than profitability ratios, especially leverage ratios as well the times interest earned ratio. Of the five sectors analysed, retailers were the most impacted.

Amongst other relationships noted between the size of companies and their propensity to lease, it was found that operating lease usage increased while finance lease usage decreased as company size increased when considering all companies analysed. Further analysis revealed that companies have material straight-lining provisions recognised in respect of future operating lease payments which need to be taken into account when analysing off-balance operating leases. In addition, it was found that operating lease capitalisation negatively impacts disclosed loan covenant ratio restrictions, although no covenant breaches were noted as a consequence thereof.

Although the capitalisation of all non-cancellable leases is advocated based on the terms of such lease agreements and the associated increase in financial risk, it is questioned whether leases will continue to be used as extensively as they currently are due to the loss of the off-balance sheet status of operating leases. However, perhaps the other benefits of leasing an asset, as opposed to buying an asset, will nonetheless result in companies leasing to the

same extent. This latter point is considered unlikely and it is rather suggested that the global leasing industry is likely to experience a substantial decrease in business activity due to the proposed change in lease accounting rules.

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APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (MPC)

Company Name	**Mr Price Group Limited**						**Legend:**				
Share Code	MPC							= input data			
Industry	Consumer services							= cell to be manually recalculated			
Super Sector	Retail							= figure not adjusted			
Sector	**General Retailers**							= adjustments & adjusted figures			
Sub Sector	Apparel Retailers						AFS	= annual financial statements			
Year-end (most recent ending before or on 30 June 2013)	**31-Mar-13**						n/a	= figure not applicable/required			
Tax rate	28%										
Data (reported and adjusted):	**Reported**	**Adjusted**	**Reported**	**Adjusted**	**Source**	**Comments**					
Financial year	**2013**	**2013**	**2012**	**2012**							
Relevant data from reported figures:	**Rm**	**Rm**	**Rm**	**Rm**							
Current assets	3 970.0	3 970.0	n/a	n/a	AFS						
Total assets	4 897.0	6 963.4	4 296.0	6 318.5	AFS	Including DT if an asset	*Workings:*				
Total equity (book value, excluding NCI)	3 316.0	3 038.6	2 781.0	2 488.2	AFS		*100.0%*	*100.0%*			
Non-controlling interests (NCI)	-	-	-	-	AFS		*0.0%*	*0.0%*			
Total equity (market value) - market capitalisation	28 752.9	28 752.9	23 011.6	23 011.6	Calc: Shares outstanding net of treasury shares x market price		*100.0%*	*100.0%*			
- Shares outstanding at year end (million)	264.6	n/a	264.6	n/a	AFS						
- Treasury shares outstanding at year end (million)	18.9	n/a	20.7	n/a	AFS						
- Closing market price per share at reporting date (R)	116.99	n/a	94.34	n/a	Investec Wealth & Investment online (McGregor BFA)						
Retained earnings	4 223.0	3 945.6	n/a	n/a	AFS						
Non-current liabilities (interest and non-interest bearing)	206.0	1 742.6	195.0	1 760.0	AFS	Including DT if a liability					
Current liabilities	1 375.0	2 182.2	1 320.0	2 070.3	AFS						
Deferred tax asset	134.0	n/a	76.0	n/a	AFS						
Deferred tax liability	5.0	n/a	1.0	n/a	AFS						
Revenue	13 720.0	13 720.0	n/a	n/a	AFS						
EBITDA	2 328.0	3 273.3	n/a	n/a	AFS						
EBIT	2 128.0	2 364.5	n/a	n/a	AFS						
Finance charges (interest expense)	-	215.1	15.0	n/a	AFS						
NOPAT	1 537.0	1 707.3	n/a	n/a	Calc: Net profit after tax + [Finance charges x (1 - tax rate)]						
Net profit after tax (total)	1 537.0	1 552.4	n/a	n/a	AFS		*Workings:*				
NPAT (attributable to owners, excluding NCI)	1 537.0	1 552.4	n/a	n/a	AFS		*100.0%*				
NPAT (attributable to NCI)	-	-	n/a	n/a	AFS		*0.0%*				
Check		-					*100.0%*				
Capital employed	3 522.0	4 781.2	2 976.0	4 248.2	Calc: Equity + long-term debt OR Total assets - current liabilities						
Check	-	-	-	-							

APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (continued)

Lease and debt data from note disclosure:												
Finance leases? Yes/No	NO		NO									
Operating leases? Yes/No	YES		YES									
Finance lease liabilities (included in liabilities above)	-		-		AFS							
- Finance lease commitment due in 1 year (not PV)					AFS							
- Current portion of finance lease liability					AFS							
- Interest rate on finance leases (if disclosed)					AFS							
Total of all interest bearing debt (included in liabilities above)	-		-		AFS	Non-current and current						
Operating lease commitments:	3 232.0	3 232.0	3 244.0	3 244.0			-					
Less than 1 year	917.0	917.0	852.0	852.0			-					
Land and buildings (Property)		888.9		825.9	AFS	Enter Property vs. Non-property						
Other than land and buildings (Non-property)		28.1		26.1	AFS							
Unknown	917.0		852.0		AFS	If no split enter under 'unknown'						
Between 2 to 5 years	1 991.0	1 991.0	1 883.0	1 883.0			-					
Land and buildings (Property)		1 930.1		1 825.3	AFS	Enter Property vs. Non-property						
Other than land and buildings (Non-property)		60.9		57.7	AFS							
Unknown	1 991.0		1 883.0		AFS	If no split enter under 'unknown'						
Later than 5 years	324.0	324.0	509.0	509.0			-					
Land and buildings (Property)		314.1		493.4	AFS	Enter Property vs. Non-property						
Other than land and buildings (Non-property)		9.9		15.6	AFS							
Unknown	324.0		509.0		AFS	If no split enter under 'unknown'						
							Workings :					
Operating lease expense recognised in income statement	1 013.0		913.0				*111.0%*					
Land and buildings (Property)	982.0		885.0		AFS							
Other than land and buildings (Non-property)	31.0		28.0		AFS							
Unknown					AFS							
Liability recognised for straight-lining of operating leases	213.0		200.0									
Current portion of straight-lining accrual	34.0		29.0		AFS							
Non-current portion of straight-lining accrual	179.0		171.0		AFS							
Liability recognised for onerous operating lease contracts	10.0		14.0									
Current portion of onerous contract provision	4.0		6.0		AFS							
Non-current portion of onerous contract provision	6.0		8.0		AFS							

APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (continued)

Interest rate applicable to finance leases:											
- Calculated per finance lease disclosure	n/a		n/a								
- As disclosed in financials	0.0%		0.0%								
Average interest rate on interest bearing liabilities	n/a		n/a								
Cost of debt (before tax) applicable to operating leases	8.5%		8.5%		Manually entered after considering applicable interest rates						
If a rate not determinable from information disclosed then use prime lending rate (8.5%).											
Loan covenants disclosed:											
N/A - no debt.					AFS						
Operating Lease Capitalisation Adjustments:					**Comments**						
	2013	**2013**	**2012**	**2012**							
	Type B	**Type A**	**Type B**	**Type A**							
	Property	**Non-property**	**Property**	**Non-property**							
Degression factor	77.0%	77.0%	77.6%	77.6%	*'Ctrl+g' runs Macro using Goal Seek*	Per Fulbier et al. (2008)					
Check	*0.0*	*-0.0*	*-0.0*	*-0.0*			-				
Minimum lease payments (MLPs) restated:	**Rm**	**Rm**	**Rm**	**Rm**			*Workings:*				
Year 1	888.9	28.1	825.9	26.1			*1*				
Year 2	684.5	21.6	641.1	20.3			*2*				
Year 3	527.1	16.6	497.7	15.7			*3*				
Year 4	405.9	12.8	386.4	12.2			*4*				
Year 5	312.6	9.9	300.0	9.5			*5*				
After 5 years (per annum)	104.7	3.3	164.5	5.2							
Remaining life (years) =	1.0	1.0	1.6	1.6							
Remaining life (years, rounded up plus 1 year) =	3.0	3.0	3.0	3.0							
MLPs per annum for Year 5+ =	104.7	3.3	164.5	5.2							
Therefore total remaining life (years) =	8.0	8.0	8.0	8.0							
Check		-		-							
Basket approach workings:											
Basket 1 MLPs	204.4	6.5	184.7	5.8							
Basket 2 MLPs	157.4	5.0	143.4	4.5							
Basket 3 MLPs	121.2	3.8	111.3	3.5							
Basket 4 MLPs	93.3	2.9	86.4	2.7							
Basket 5 MLPs	207.9	6.6	135.5	4.3							
Basket 6 MLPs	104.7	3.3	164.5	5.2							
Basket 1 remaining life (years)	1	1	1	1							
Basket 2 remaining life (years)	2	2	2	2							
Basket 3 remaining life (years)	3	3	3	3							

APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (continued)

Basket 4 remaining life (years)	4		4	4								
Basket 5 remaining life (years)	5		5	5								
Basket 6 remaining life (years)	8		8	8								
Check	-		-	-								
Basket 1 present value of operating lease liability (PVOL)	188.4		5.9	170.3		5.4						
Basket 2 PVOL	278.8		8.8	254.0		8.0						
Basket 3 PVOL	309.6		9.8	284.3		9.0						
Basket 4 PVOL	305.7		9.7	283.1		9.0						
Basket 5 PVOL	819.1		25.9	534.0		16.9						
Basket 6 PVOL	590.4		18.6	927.4		29.3						
Total of PVOL of baskets =	2 492.0		78.7	2 453.1		77.6						
Check	-		-	-		-						
Total PVOL estimate =	2 570.7			2 530.7								
Percentage of useful life of leased assets expired (assumed) =	50.0%		50.0%	50.0%		50.0%						
Basket 1 asset ratio adjustment factor	96.1%		96.1%	96.1%		96.1%		Per Imhoff et al. (1991)				
Basket 2 asset ratio adjustment factor	92.5%		92.5%	92.5%		92.5%						
Basket 3 asset ratio adjustment factor	89.1%		89.1%	89.1%		89.1%						
Basket 4 asset ratio adjustment factor	86.1%		86.1%	86.1%		86.1%						
Basket 5 asset ratio adjustment factor	83.3%		83.3%	83.3%		83.3%						
Basket 6 asset ratio adjustment factor	76.0%		76.0%	76.0%		76.0%						
Leased asset estimate (∑ PVOL x asset ratio adj factor) =	2 108.8		66.6	2 045.4		64.7						
Total leased asset estimate =	2 175.4			2 110.1								
Adjustments:												
PVOL adj by straight-lining & onerous contract liabilities =	2 347.7	Cr		2 316.7	Cr							
Current portion of PVOL =	807.2	Cr		750.3	Cr							
Non-current portion of PVOL =	1 540.5	Cr		1 566.5	Cr							
Leased asset estimate adj by straight-lining liability =	1 962.4	Dr		1 910.1	Dr							
Difference between PVOL and leased asset =	385.3	Dr		406.7	Dr							
Retained earnings adjustment after tax (debit) =	277.4	Dr		292.8	Dr							
Deferred tax adjustment (debit) =	107.9	Dr		113.9	Dr							
Current year profit impact (after tax) =	-15.4	Dr/(Cr)										
Current year profit impact (before tax) =	-21.4	Dr/(Cr)										
Reconciliation of profit line items impacted:	-21.4	Dr/(Cr)										
Operating lease expense (reversed)	-945.3	(Cr)				93.3%	[check - equal to or less than 100%]					
Interest expense (recognised)	215.1	Dr						Interest on PVOL opening balance				
Amortisation on right-of-use asset (recognised)	708.8	Dr				33.6%	[check - must be less than 100%]	Balancing figure				

APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (continued)

Financial Statement Ratios:	Original	Adjusted	Absolute Change	Relative % Change	Numerator	Denominator
Debt management						
Debt ratio	32.3%	56.4%	24.1%	74.6%	Total debt	Total assets
Debt-to-equity ratio (based on book value)	47.7%	129.2%	81.5%	170.9%	Total debt (incl DT if liability)	Equity BV (incl NCI)
Debt-to-equity ratio (based on market value)	5.5%	13.7%	8.2%	148.2%	Total debt (incl DT if liability)	Market capitalisation + NCI
Times interest earned	n/a	11.0	n/a	n/a	EBIT	Interest expense
Liquidity						
Current ratio	2.89	1.82	-1.07	-37.0%	Current assets	Current liabilities
Profitability						
EBITDA margin	17.0%	23.9%	6.9%	40.6%	EBITDA	Revenue
EBIT margin	15.5%	17.2%	1.7%	11.1%	EBIT	Revenue
Net profit margin	11.2%	11.3%	0.1%	1.0%	Net profit	Revenue
Return on assets	33.4%	25.7%	-7.7%	-23.1%	NOPAT	Average total assets
Return on capital employed	47.3%	37.8%	-9.5%	-20.1%	NOPAT	Average capital employed
Return on equity	50.4%	56.2%	5.8%	11.4%	Net profit (excl NCI)	Average equity BV (excl NCI)
Asset management						
Asset turnover	2.98	2.07	-0.92	-30.8%	Revenue	Average total assets
Market value						
Earnings yield	5.9%	6.0%	0.1%	1.0%	Net profit (excl NCI)	Average market capitalisation
Price-earnings ratio	18.71	18.52	-0.19	-1.0%	Market capitalisation	Net profit (excl NCI)
Market-to-book value	8.67	9.46	0.79	9.1%	Market capitalisation	Equity BV (excl NCI)
Other analysis:	**2013**		**2012**			
Capitalised operating lease liability % total reported debt	148.5%		152.9%			
Capitalised operating lease liability % finance lease liability	n/a		n/a			

APPENDIX A: Illustrative example of lease capitalisation model – Mr Price Group Limited (continued)

Failure Prediction (Altman Z-scores):	Original	Adjusted	Absolute Change	Relative % Change	Numerator	Denominator
Altman original Z-score (Z):						
X_1	0.53	0.26	-0.27	-51.5%	Working capital	Total assets
X_2	0.86	0.57	-0.30	-34.3%	Retained earnings	Total assets
X_3	0.43	0.34	-0.09	-21.9%	EBIT	Total assets
X_4	18.19	7.33	-10.86	-59.7%	Market value of equity	Book value of total liabilities
X_5	2.80	1.97	-0.83	-29.7%	Sales	Total assets
Altman Z-score = $1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$ =	16.99	8.59	-8.40	-49.5%		
Is the company likely to fail (high bankruptcy risk)?	No	No				

Z-score zones:	Failure?
< 1.81	Yes
1.81 - 2.99	Uncertain
> 2.99	No

Altman revised Z''-score (Z''):						
X_1	0.53	0.26	-0.27	-51.5%	Working capital	Total assets
X_2	0.86	0.57	-0.30	-34.3%	Retained earnings	Total assets
X_3	0.43	0.34	-0.09	-21.9%	EBIT	Total assets
X_4	2.10	0.77	-1.32	-63.1%	Book value of equity	Book value of total liabilities
Altman Z''-score = $6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$ =	11.41	6.63	-4.78	-41.9%		
Is the company likely to fail (high bankruptcy risk)?	No	No				

Z''-score zones:	Failure?
< 1.10	Yes
1.10 - 2.60	Uncertain
> 2.60	No

APPENDIX B: List of JSE-listed companies included in final sample

Sector	*n*	Companies included in final sample
Food & Drug Retailers	4	Clicks Group Ltd (CLS); Pick n Pay Holdings Ltd (PWK); Shoprite Holdings Ltd (SHP); The Spar Group Ltd (SPP)
General Industrials	11	Argent Industrial Ltd (ART); Astrapak Ltd (APK); Barloworld Ltd (BAW); Bowler Metcalf Ltd (BCF); Eqstra Holdings Ltd (EQS); Kap Industrial Holdings Ltd (KAP); Mpact Ltd (MPT); Nampak Ltd (NPK); Remgro Ltd (REM); The Bidvest Group Ltd (BVT); Transpaco Ltd (TPC)
General Retailers	17	Advtech Ltd (ADH); African and Overseas Enterprises Ltd (AOO); Cashbuild Ltd (CSB); Combined Motor Holdings Ltd (CMH); Curro Holdings Ltd (COH); Holdsport Ltd (HSP); Italtile Ltd (ITE); JD Group Ltd (JDG); Lewis Group Ltd (LEW); Massmart Holdings Ltd (MSM); Mr Price Group Ltd (MPC); Nictus Ltd (NCS); Taste Holdings Ltd (TAS); The Foschini Group Ltd (TFG); Truworths International Ltd (TRU); Verimark Holdings Ltd (VMK); Woolworths Holdings Ltd (WHL)
Industrial Transportation	7	Cargo Carriers Ltd (CRG); Grindrod Ltd (GND); Imperial Holdings Ltd (IPL); Santova Logistics Ltd (SNV); Super Group Ltd (SPG); Trencor Ltd (TRE); Value Group Ltd (VLE)
Travel & Leisure	9	City Lodge Hotels Ltd (CLH); Comair Ltd (COM); Cullinan Holdings Ltd (CUL); Famous Brands Ltd (FBR); Phumelela Gaming & Leisure Ltd (PHM); Spur Corporation Ltd (SUR); Sun International Ltd (SUI); Tsogo Sun Holdings Ltd (TSH); Wilderness Holdings Ltd (WIL)
Five sectors (entire sample)	48	